



J. J. WHITE, INCORPORATED

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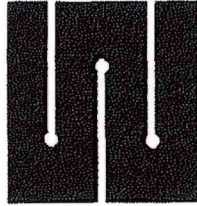
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- Appendix 1: Disciplinary Policy for Safety Violations**
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J. J. WHITE, INCORPORATED SAFETY AWARENESS POLICY

This safety program is designed to help prevent accidents and to save lives.

The program is also intended to serve as a reference document to help employees comply with the requirements of the Occupational Safety & Health Administration and other applicable federal, state, and local safety regulations.

Construction work involves many types of physical hazards and possibilities of accidents. However, accidents and risks can be greatly reduced if everyone on the job knows and follows proper practices.

Some basic safety rules for many operations that journeymen perform have been incorporated into this program. The rules are not difficult; on the contrary, most are relatively simple, easily understood, common sense procedures that should be part of normal practices.

Although we have designated responsibilities, Safety is everyone's responsibility and must be practiced at all times on and off the job.

Any modifications or revisions to this manual must be approved in writing by James Daley, President of J. J. White, Inc.

All (General, Mechanical, HVAC, Exchanger, Tank, and Electrical Groups) Superintendents, General Foreman and Foreman are required to read through this program each year upon receipt of new revised editions and periodically thereafter. Particular attention should be paid to new entries and revisions.

J. J. White, Incorporated has a "Hazard Communication" program that is available at every job-site, and new employees will receive their instruction from it.

A handwritten signature in blue ink, appearing to read 'James Daley', is positioned above the printed name and title.

James Daley
President

Revised 02/01/2024

INDIVIDUAL SAFETY RESPONSIBILITIES

1. Safety Coordinator

- A. During job site safety inspections, to observe all safety practices and report any violations to Job Superintendent in writing. These inspections will be conducted on a regular basis (weekly as a minimum).
- B. To supply jobs with current safety posters, toolbox talk information, training videotapes, and material safety data sheets.
- C. To review accident information with insurance company safety engineers and to discuss methods for preventing future accidents and injuries. These are meetings to be held monthly.
- D. To investigate all OSHA Recordable accidents and review the information with the insurance company safety engineer and the responsible job superintendent.
- E. To conduct any “near-miss” investigations.
- F. To maintain records of employee safety training, respirator fit-testing and medical clearance, injury/illness statistics, and other safety information.
- G. To attend the pre-job meeting to review applicable job-specific safety procedures and work practices. The job superintendent and all subcontractors should also attend the pre-job meeting.

2. Job Superintendent

- A. To enforce company, local, state, OSHA and other applicable Federal (DOT) regulations throughout length of job, including subcontractors.
- B. To make written accident reports on all accidents no matter how minor.
- C. To enforce company rule of twice a week toolbox talks. Videotapes are also to be utilized. Minutes to be forwarded to company Safety Services Manager weekly.
- D. To train all new employees in the Hazard Communication Standard (Right-To-Know-Law), and retrain all employees annually.
- E. To post an inventory of J.J. White, Inc.’s hazardous substances on job site.
- F. To maintain a file of Safety Data Sheets for use by all employees.
- G. To conduct on-site surveys of hazardous substances, create specific exposure assessment plan, and procure appropriate Material Safety Data Sheets.

- H. To locate and instruct all employees where the Owner's Safety Data Sheets are located for each area worked.
- I. To maintain and keep accessible an OSHA approved First Aid Kit on job. An inventory will be conducted weekly and supplies replaced as required.
- J. To post OSHA Number 300 log on bulletin board no later than the 1st of February for each calendar year.
- K. To assure that all employees are instructed in the known potential fire, explosion, and toxic release hazards at the job site, and the applicable provisions of the emergency action plan (fire, gas, and evacuation alarms, responsible to medical emergencies, etc.)
- L. To assure that each employee is trained in the safe work practices necessary to safely perform his/her job.
- M. To investigate near misses and illnesses. These will be reviewed with the Safety Coordinator for trends.
- N. Injuries, illnesses and any unique hazards encountered during the project must be reported to the Owner's representative immediately.
- O. To ensure a daily work area clean-up and weekly overall housekeeping inspection.
- P. To provide and review the Owner's Safety and Security Requirements for Contractors with all employees and subcontractors before any work is started.
- Q. To tour jobsite weekly using the *"eTracker Safety Inspection Checklist"* and conduct a *"Tool Box Safety Talk Report"* (see Appendix 5). A copy of both the inspection report and toolbox safety report must be sent to the attention of Company Safety Services Manager to comply with record keeping requirements.

3. Job Foreman

- A. To strictly enforce company, local, OSHA, and other applicable Federal (DOT, etc.) regulations with their individual men.
- B. To make sure that all accidents are reported to Job Superintendent no matter how minor.
- C. To immediately report to the job superintendent any serious or unusual safety conditions or concerns regarding the processes or equipment at the job site.

4. Individual Workers

- A. To read, understand and comply fully with all J. J. White, Inc. and Owner Safety rules and regulations.
- B. To immediately report all injuries to his/her Foreman and Superintendent.
- C. To immediately report to his/her Foreman and Superintendent any serious or unusual safety conditions or concerns regarding the processes, equipment, work procedures and work practices at the job site.
- D. To pass along all safety recommendations to his/her Job Foreman.
- E. To plan, schedule, and work jobs with safety as the top priority.
- F. To check all hot work permits and comply with all provisions.
- G. To follow Lockout/Tagout Procedures on any energized equipment.
- H. To ensure that all scaffolding they work on is complete and fit for use and have been inspected and tagged prior to use.
- I. To ensure that his or her job is completely safe and protected from imminent danger, using common sense and hazard recognition.
- J. The key element is, if you are not certain, ask your supervisor. Never assume. Each individual is the cornerstone to good job safety.

GENERAL SAFETY AND SECURITY

1. Safety Procedures and Rules

All employees upon hire shall be advised of the Company's safety procedures and rules. Employees must read, understand, and follow all safety rules and regulation, and work safely at all times. Employees and subcontractors that violate safety rules, regulations or procedures will be subject to disciplinary action as outlined in the J. J. White, Inc. "Disciplinary Policy for Safety Violations" (refer to Appendix 1).

2. Safety Complaints and Sanctions

Any safety concerns or complaints shall be brought to your immediate supervisor (not the owner). Any employee who jeopardizes your safety will be disciplined.

3. OSHA Poster and DOL “Safety and Health Regulations for Construction”

All jobs shall have an OSHA safety poster posted. A copy of the “Department of Labor Safety and Health Regulations for Construction” is to be available in the field office at every job. A “Family and Medical Leave Act”/“FMLA” poster shall also be posted directly adjacent to the OSHA poster.

4. Security

Employees are expected to lock all toolboxes, trailers and other equipment at the end of each workday. Employees must comply with all security procedures at the owner’s facilities. Firearms and explosives are strictly prohibited and employees violating this Federal law are subject to dismissal and prosecution.

5. Substance Abuse

The use or possession of alcohol, illegal drugs, or the improper use of legal drugs is strictly prohibited. Any employees found under the influence of alcohol or drugs on the job shall be terminated immediately.

6. General Conduct

Employees shall behave in a mature, professional manner. Horseplay, fighting, gambling and harassment of any type are prohibited. All employees are to respect and refrain from use of owner facilities, i.e. bathroom, shower or cafeteria facilities, unless specifically authorized.

7. Smoking

Smoking in unauthorized areas, or at unauthorized times, shall result in immediate dismissal of the employee. Please adhere to the facility owner’s rules regarding designated smoking areas.

8. Emergency Phone Numbers

Emergency phone numbers shall be posted on all jobs in a conspicuous location(s). Please know them by memory, or write them down and have them on your person at all times.

9. Reporting of Accidents and Incidents

Employees are to report all injuries to their immediate Supervisor – no matter how minor. The job foreman or superintendent will then immediately notify the J. J. White Site Safety Coordinator and the Vice President of Risk Management.

Employees must also report all incidents (i.e., fires, spills, releases, vehicle accidents, property damage) to their immediate Supervisor and Owner’s representative.

10. Accident Investigations

A Safety Coordinator or the Vice President of Risk Management, using the “Accident Investigation Report” form included as Appendix 3, shall investigate all accidents and near miss incidents.

11. First Aid Treatment

Employees shall not use Owner’s first aid facility unless it is an emergency. A J.J. White employee, trained in proper First Aid Procedures, if available, shall render treatment or the worker shall be sent immediately to the hospital. A First Aid Kit, which meets the guidelines set forth by OSHA, will be kept on the job at all times and checked/ logged weekly for complete inventory. In the event of a serious injury, employees should follow the Owner’s procedure (emergency alarms, phone numbers, etc.) for reporting medical emergencies.

12. Bloodborne Pathogens Exposure Control Plan

J. J. White employees designated and trained in proper first aid procedures are included in the company’s “*Bloodborne Pathogens Exposure Control Plan*”. Please refer to Appendix 4.

13. Housekeeping

The Superintendent shall enforce the keeping of the jobsite clean and free from rubbish, scrap, debris, combustibles, etc., at all times during the progress of the work. At the close of his/her work, clean and repair the premises and any adjacent work damages or marred by his/her operations and leave the premises clean as far as his or her work is concerned. Rubbish containers shall be clearly marked and placed in locations throughout the jobsite. Milk cartons, drink bottles, cups, food scraps, etc., must be cleaned up daily. All passageways, aisles, stairways, etc. must be kept free of tripping hazards.

14. Waste Removal

Waste materials shall not be placed in Owner’s containers, unless previously decided among the Owner and J. J. White, Inc. Typically, J. J. White, shall provide their own containers. All waste not considered ordinary municipal waste, whether it is hazardous or not, shall be considered the Owner’s, not J. J. White’s responsibility to handle and remove.

15. Asbestos

Asbestos will not be removed or handled by J.J. White, Inc. employees. A trained, licensed subcontractor to be retained by the Owner, or subcontracted by J. J. White, Inc., must always perform this work. J.J. White employees shall contact their job foreman, superintendent or safety coordinator, if they encounter materials thought to or even suspected or containing

asbestos. Any unlabeled insulation shall be considered asbestos until proven otherwise by a laboratory test.

16. X-Rays/ Radiography

If it becomes necessary to perform radiography work, this work shall be performed by an approved subcontractor. Proper barricades must be erected. Please refer to the J.J. White, Inc. Job Hazard Analysis Manual, JHA-013, for more detailed information.

17. Drinking Water

Drinking water is to be stored in identified containers with adequate disposable cups and cup dispensers. Also suitable trash containers for disposal of cups shall be furnished and said containers shall be emptied daily, and cleaned as necessary.

18. Safety Procedures during Severe Weather Conditions

A. Electrical Storms

All crane, pole truck, backhoe and line work shall be stopped during electrical storms. Booms are to be lowered. Operators are not to remain in their heavy equipment during electrical storms.

All fieldwork is to be stopped during electrical storms. All personnel are to return to their trailers on-site, until the weather condition has passed, and no lightning has been seen for at least 30 minutes.

B. High Winds

All crane lifts shall be stopped during high winds in excess of 25 mph. No line bucket work or manbasket operations are permitted during high winds in excess of 15 mph.

C. Hot Weather

To help prevent heat stress, employees working in hot, humid areas should frequently drink small quantities of cool water. The job foreman or job superintendent should use good judgment in assessing employee needs on hot days, and extra consideration should be given to those distant from a potable water source and those wearing extra safety gear (i.e. welding leathers, rain gear, Tyvek coveralls, Nomex or Indura coveralls, respirators, SCBA's, etc.). In addition, some type of sports drink, i.e. Gatorade or Squincher, shall be provided to assist in the re-hydration of necessary vitamins and minerals. The sports drink should be consumed on a one to one ration with water.

19. Lead

Under NO circumstances may a J. J. White Supervisor direct employees, or allow employees, to be occupationally exposed to lead.

If there is a suspicion that a material contains or is coated with lead, it is J. J. White's obligation to get a definite answer, either from the Owner or through proper testing procedures, performed by and paid for by the Owner, as to whether this containment is present. Until that determination is made, no one is permitted to handle the suspect material. Following are examples of some materials that may contain lead:

- Lead based paint, such as you would find on older structural steel, pipe and interior surfaces such as wood, molding, sub-bases and walls.
- Lead Soldered Joints.

The use of lead free solder (antimony & tin) is required for all new and renovation soldered joints.

It should also be noted that the primary routes of entry into the body are ingestion (through the mouth) and inhalation (breathing lead fumes). For this reason every effort must be made to avoid areas where lead is being poured and fumes generated, and observe good personal hygiene habits by washing your face and hands thoroughly before smoking or eating.

These precautions should be observed if you believe you have been inadvertently exposed to lead. Please refer to Appendix 16, "*Safety Program for Lead*," for additional information.

20. Audits/Inspections

The Safety Coordinator will conduct daily safety inspections and report any concerns to the Job Superintendent. In absence of a Safety Coordinator, the Job Superintendent, is required to complete the daily inspections and correct any problems. The "*eTracker5 Safety Inspection*" form, included as Appendix 5, will be used to document the inspection results. Completed forms shall be forwarded to the Company Safety Services Manager on a regular basis.

21. Access to Employee Exposure and Medical Records

Employees may review and obtain copies of any medical and exposure records held by the Company, once a request is made to and approved the Corporate Safety Coordinator. The employee's collective bargaining agent(s) may also obtain the records *only with* the employer's and employee's written consent. "Medical" records include the results of any pulmonary function tests for respirator clearance, drug testing results, or any other medical tests or examinations. "Exposure" records include tests such as noise dosimeter and benzene badge sampling.

22. Imminent Danger (Serious) Safety Violations

The following is a representative list of Imminent Danger Safety Violations, which upon the first recognition, work will be stopped and the violations will be correct by the superintendent, foreman or worker before work resumes:

- A. Leaving an occupied confined space unattended.
- B. Removing (or shutting down) airlines being used for Confined Space Entry ventilation without notifying entrants and standby personnel.
- C. Leaving a fire watch position unattended while hot work is being performed.
- D. Circumventing LO/TO procedures.
- E. Knowingly moving under or standing under a suspended load.
- F. Smoking in an unapproved area.
- G. Moving from one spot to another at an elevation when exposed to an unprotected fall and not practicing 100% Tie Off techniques.
- H. Entering confined spaces without a permit, without qualified standby personnel, or without the proper personal protective equipment.
- I. Performing work without the required permit.
- J. Lack of proper excavation shoring.
- K. Improper towing of equipment.

23. Care and Maintenance of J. J. White Tools and Equipment

- A. All tools and equipment shall be treated with the greatest care.
- B. Failure to do so is cause for immediate termination.
- C. All tools and equipment are to be inspected prior to use.

SPECIFIC SAFETY PROCEDURES

1. Eye Protection

Eye protection is required on all jobs. It is mandatory that the employee wear safety glasses with side shields at all times. Sealed safety glasses are recommended.

It is a requirement that all glasses, prescription and non-prescription, meet the American National Standards (ANSI) Standard Z-87.1 "Industrial Safety Eyewear".

It is each individual workers obligation to purchase his own prescription safety lenses meeting the ANSI specification, Z-87.1, if necessary. Until their optician has fit each employee, they must wear mono-goggles or visitor's spectacles over their non-safety type prescription glasses to comply with OSHA requirements. J. J. White is obligated to supply safety glasses with standard nonprescription lenses.

The following types of eye protection are recommended for the specific applications:

- A. Safety glasses with side shields for flying particles. Sealed safety glasses are recommended.
- B. Impact-resistant goggles for flying particles.
- C. Non-vented splash goggles for liquid chemicals.
- D. Face shield for maximum face and throat protection.
- E. Welding shields for welding and cutting.

2. Hard Hats

ANSI-approved safety hats shall be supplied and worn at all times. Generally, hard hats are available in small, medium, and large sizes. It is recommended that hard hats be discarded after one year of use.

Hard hats must not be worn on top of everyday caps and hats. Winter liners made especially for the hat shall be used. The hard hat shall be worn, as designed, with the brim facing forward to provide protection for the forehead and face. The hardhat worn shall be a J. J. White issued MSA V-Gard hardhat.

Fiber Metal hardhats will be made available for welding purposes only. Some owners may require a fiber metal hard hat instead of a soft cap while welding. Fiber metal hard hats are only to be worn when welding.

3. Shoes and Work Clothing

Sturdy leather work boots, long pants and shirts are mandatory at all times. Employees must comply with any additional work clothing requirements by the Owner.

Nomex or Indura (fire-retardant) clothing is required in all of the refineries located in the Delaware Valley. Whenever Nomex or fire-retardant clothing is required, the coveralls shall be worn with the sleeves rolled all the way down and buttoned and the coverall zipped all the way up and buttoned.

4. Hearing Protection

Hearing protection shall be supplied and worn by employees when operating a jackhammer, near pile drivers, or any other operation creating high noise levels, above 85 dBA. Hearing protection will also be required anytime tools such as grinders, drills, etc. are used in a confined space. A general rule of thumb with regards to hearing protection is that it is required when you have to shout to someone standing next to you.

Whenever possible, employees should reduce their exposure to high noise levels by minimizing their time in the noisy areas; increasing their distance from the noise source; placing noise – reduction barriers such as welding curtains and wood panels between the noise source and their work area and damping the vibrational response of materials that are being hammered or fabricated. Additionally, hearing protection will be provided at every jobsite.

5. Respirators

Where the maintenance or repair of the equipment involves the exposure, or possible exposure, of employees to concentrations of dust, benzene or other harmful substances, NIOSH approved respirators shall be supplied and utilized. Refer to the J. J. White, Inc. *Respirator Program*, included as Appendix 6.

6. Hazard Communication Program

The Company has prepared a comprehensive written Hazard Communication Program to inform employees of the hazardous properties of the chemicals used at the jobsite. The program consists of detailed hazardous chemicals lists, material safety data sheets, container labeling procedures, and employee education and training requirements. All employees are required to read and understand information included in the J. J. White, Inc. *Hazard Communication Program*.

7. Hazardous Materials Labels and Placards

The U.S. Department of Transportation requires that packages, freight containers, and transport vehicles be supplied with labels and placards to communicate the hazards posed by materials in transport. The label (on a package) and the placards (on a freight container, motor vehicle, or rail car) represent the hazard class of the materials being transported.

Refer to Appendix 7, DOT Labeling and Placarding Systems, for a description of the required placards and labels.

8. Flammable Liquids

All flammable liquids shall be stored in safety cans. Containers for bulk storage of flammable liquids shall be as specified by OSHA. Containers shall be clearly marked as to contents and a “No Smoking” sign posted in the storage area. A 20 or 30 pound, dry chemical fire extinguisher shall be available.

9. Engine Fueling

Engines must be stopped before adding fuel to the tank and gasoline must be transported in an approved safety can.

10. Hot Work Permits

- A. In many facilities where we perform work, hot work permits are required daily and must be obtained through the Owner’s Field Representative before any work is started. Make sure that the permits are specific to the work that will be performed.
- B. The procedure for issuing Hot Work Permits may vary from one plant to another. The rules applying to the plant or area involved must be determined by the J. J. White Job Superintendent OR Safety Coordinator in consultation with (OPS to determine) the Owner’s Field Representative.
- C. Hot Work Permits are required for any operation or procedure where open fires, sparks, flames or other heat producing or spark generating devices might ignite flammable vapors. These include, but are not limited to, the following procedures or equipment operations:
 - Chain saws
 - Compressors
 - Reinforced Concrete Demolition
 - Electric Drills
 - Electric Equipment (non-low voltage lighting)
 - Electric Extension Cords and Lights (non-low voltage lighting)
 - Electric Welding
 - Emergency Lighting (non-low voltage lighting)
 - Gas Welding
 - Grinding
 - Hot Tap Operation
 - Internal Combustion Engines
 - Motorized Vehicles
 - Photo Flash Bulbs
 - Portable Electrical Equipment
 - Sandblasting
 - Space Heaters

11. Fire Protection

The Company shall provide for firefighting equipment as specified by OSHA.

All firefighting equipment shall be conspicuously located. Access to firefighting equipment shall be maintained at all times.

All firefighting equipment shall be periodically inspected and maintained in good operating condition.

12. Fire Extinguishers and Equipment

J.J. White, Inc. or the Owner shall provide all fire extinguishing equipment, including fire blankets and fire extinguishers. When required, fire-resistant tarpaulins shall be used on all jobs where hot work will take place.

J.J. White employees are not to use an Owner's fire extinguishers or fire hoses, except under actual fire-fighting emergency conditions. Notify the Owner's Fire Chief, or equivalent, if you use or move an Owner's fire extinguisher.

The following types of fire extinguishers are appropriate for the indicated classes of flammable/combustible materials:

Class "A" - Combustible materials (wood, paper, textiles, rubbish)

Class "B" - Flammable or combustible liquids (gasoline, ethanol, fuel oil)

Class "C" – Electrical equipment (motors, generators, breaker boxes) /Current

Class "D" – Combustible/ Flammable Metals (sodium, potassium, magnesium)

Class "A:B:C" combination extinguishers are generally recommended for "hot work" operations where more than one type of flammable/combustible materials are present.

13. Containment Dike Removal or Replacement

Containment dikes that surround a tank that is in service may not be removed or have a hole cut in it without authorization from the Owner's Fire and/ or Environmental Department representative. All dikes must be restored at the end of the work shift unless otherwise specified by the owner representative.

14. Response to a Fire or Emergency

In the event of a fire, pull the alarm (if applicable) and notify the plant operator before attempting to fight the fire. Only attempt to fight *small, incipient stage fires*. Do not attempt to fight incipient stage fires without the proper fire extinguishers, or if you have any doubts about your ability to safely use the extinguisher.

Remember the old, proven saying “When in Doubt, Get Out!!” Let the professionals fight any fire that has gone beyond an incipient stage, or fires that you do not feel comfortable extinguishing. Never attempt to use any firefighting equipment if you have not been properly trained in its use.

When an emergency alarm sounds, remember to meet at the pre-arranged muster/ assembly point (generally at the J.J. White trailers or outside the contractor entrance gate). Unfortunately, many firefighters have been injured or killed while searching for “unaccounted” employees who did not properly muster/ assemble during a fire or emergency.

All employees must be aware of the emergency procedures, including the emergency telephone number and evacuation routes, for the specific facility where they are working.

15. Barriers

Temporary barriers or rails and warning lights shall be erected around ditches, stairs, roofs and walls, and at access levels to temporary stairs or ladders. Drums are not to be used as barriers. For more details information please refer to the J.J. White, Inc. Job Hazard Analysis Manual – JHA-021 *Guarding* (Floor, Wall & Roof) Openings.

16. Electrical Safety

This procedure shall be used for work performed on or near exposed energized and de-energized parts of electrical equipment. The intent is to reduce the number of electrical accidents resulting from unsafe employee work practices and/or unsafe conditions.

Whenever physically possible, energized electrical equipment shall be locked-out and tagged.

Only *qualified employees* are permitted to work on or near exposed energized parts of electrical equipment which cannot be locked-out and tagged. Such employees must be capable of working safely on energized circuits and must be familiar with the use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

Portable ladders- Portable ladders must have non-conductive side rails if they are used where the employee or the ladder could conduct exposed energized parts.

Conductive apparel- Conductive articles of jewelry or clothing (such as watch bands, bracelets, rings, key chains, necklaces, metallic aprons, cloth with conductive threads, or metal headgear) may not be worn if they might contact exposed energized parts.

Housekeeping – Where live parts present an electrical hazard, employees must not perform housekeeping duties at distances close enough to the parts that there is a possibility of contact unless adequate safeguards (such as insulating equipment or barriers) are provided.

Ground Fault Circuit Interrupters (GFCI) – Must be used on all electric tools (i.e. Grinders, Drills, Motors, Etc.) and all temporary electric lighting. J. J. White, Inc. uses ground fault interrupters in lieu of an assured grounding program. All GFCI must be checked daily to assure they are functioning properly.

Flexible (extension) cords- May need explosion proof plugs and must be used in conjunction with a Ground Fault Circuit Interruption System. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment. Flexible cords may not be fastened with staples or otherwise hung in such a fashion that could damage the outer jacket or insulation.

Visual inspections- Portable cord and plug-connected equipment, including flexible cord sets (extension cords) must be visibly inspected before use on any shift for visible defects (such as loose parts, deformed and missing pins, or damage to outer jacket or insulation) and for evidence of possible internal damage, such as pinched or crushed outer jacket. If a defect is detected, the item must be removed from service immediately and either be repaired or replaced.

Connecting attachment plugs- Employees hands may not be wet when plugging and un-plugging flexible cords and cord- and plug-connected equipment, if energized equipment is involved.

Alerting techniques- Safety signs and tags, barricades, and/or attendants must be use to warn and protect employees from hazards, which could cause injury due to electric shock, burns, or failure of electric equipment parts.

17. Working near Overhead Power Lines

If work is to be performed near overhead lines, the following regulations apply:

When an employee works in an elevated position near overhead lines, the location must be such that the person and longest conductive object he or she may contact cannot come closer to an unguarded, energized overhead line than the following distances:

- Voltages to ground 50 Kv or below – 10 feet
- Voltages to ground 50 Kv or above – 10 feet plus 4 in. for every 10 Kv over 50 Kv

Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines must be operated so that a clearance of at least 10 feet is maintained. If the voltage is higher than 50Kv, the clearance must be increased 4 inches for every 10 Kv above that voltage.

18. Equipment Lockout/ Tagout (LOTO)

Procedure – This procedure shall be used to insure the personal safety of people working on or around equipment and machinery.

All types of energy sources, including electrical, mechanical, hydraulic, pneumatic, chemical, and thermal, must be isolated and controlled with locks and tags if the job requires an employee to bypass a guard or other safety device or to enter the “point of operation” or “danger zone” of a machine. In addition to applying locks and tags to the energy isolating devices, all sources of stored energy (such as that in springs, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure) must be dissipated or restrained before working on the equipment or machinery.

The Owner will most likely have a detailed lockout/tagout procedure and permit system that will outline procedures for de-energizing the equipment, locking and tagging the equipment, and restoring the equipment to normal operations after the work is completed. All employees shall comply with the Owner’s lockout procedures. It is the Owner’s responsibility to isolate and lockout the equipment and systems to be worked on. J. J. White, Inc. is not permitted to close or render inactive any system in any Owner’s facility.

Each foreman whose crew works on any equipment must verify that the equipment has been locked out and that all energy has been released. Once that verification has been made, the foreman shall then place a lock on the lock box or similar type device that the Owner utilizes. A tag or label should accompany the lock for identification purposes. This lock should remain on for the life of the maintenance work. Immediately following the completion of the work, the foreman shall remove the lock so that the system may be returned to operation.

All individuals who will be performing a maintenance activity on any equipment that has been locked out must place a personal lock on the lock box or similar type device that the Owner utilizes prior to the start of any work. At the end of the individual’s shift, or prior to the individual leaving the facility, the lock must be removed.

Refer to Appendix 8 – “*Lockout/ Tagout Training, Procedure and Checklist*”, for mandatory requirements.

19. Line Testing (or Tightness Testing of Existing Lines)

A. Purpose:

Lines will be pressure tested and visually inspected while holding a safe pressure no higher than the maximum allowed per the flange rating. The lines will be pressured up with an approved test medium, either water, or nitrogen (depending on what service the line is in) to maintain a predetermined pressure while the line is visually inspected. At times it may be necessary to test with line product, this will require approval from Client, J. J. White Safety, and J. J. White Risk Management.

B. Procedure for Operators:

Prior to any work on pipelines, the following sequential actions must be followed

1. Shutdown of line.
2. Install operators' red and white "Danger- Do Not Operate Tag"
3. Record in the Unit Log Book the specific line or lines involved, work that is being performed, or any other special instructions.
4. Removal of all "Danger- Do Not Operate Tags" is only to be removed by the operator.

C. Procedure for Mechanics:

Prior to any work on pipelines, the following sequential actions must be followed:

1. Shutdown of line. – Completed by the Owner.
2. The assigned work crew is to see a Unit Operator for the specific line that is to be worked on and request a work permit.
3. The mechanics will procure red and white "Danger- Do Not Operate" tags from the Owner representative, and attach to the same device that has been secured by the operator's tag.
4. Each maintenance work crew shall remove their tag when the job is completed (in the presence of the operator).

5. When mechanics show up for a job, all workers must be given site-specific safety information. This will be accompanied by viewing the work permit with each member of the crew. Their review also includes highlighting the job location on an area map and a job site review. It is the responsibility of the contractor supervisor to assemble his workers outside the control room in preparation for the site-specific information. After reviewing the completed work permit, all contractor employees must sign the back of the permit (in addition to the supervisor signing the front of the permit.)

D. Precautions and Special Instructions:

1. A person shall be assigned to walk the line and visually inspect it while it is under pressure.
2. The person operating the test pump should be in radio contact constantly with the person walking the line while there is pressure in the line.
3. If the predetermined test pressure must be maintained, then blinds may be installed.

Note: Additional information may be obtained from the JHA Manual, JHA – 035 – “*Pressure testing of piping and equipment*”.

20. Confined Space (Vessel) Entry Procedure

J.J. White’s Confined Space Entry procedure is designed to inform employees of the hazards of confined spaces and to provide the safety requirements, including a permit system, to protect employees who enter confined spaces. The procedure is also intended to help employees who enter confined spaces. The procedure is also intended to help employees comply with the requirements of the Occupational Safety & Health Administration Standard, 29 CFR 1910.146 titled “Permit Required Confined Spaces”.

A confined space is an area that:

- A. is large enough and so configured that an employee can bodily enter and perform assigned work; or
- B. has limited or restricted means for entry or exit; or
- C. is not designed for continuous employee occupancy.

Examples of confined spaces include tanks, vessels, reactors, fermenters, sewers, some manholes, incinerators, silos, and boilers.

Entry into any confined space is absolutely forbidden until all safety precautions contained in the Owner's Confined Space (Vessel) Entry permit have been carried out, and the Owner has issued a confined space entry permit.

The J.J. White, Inc. "Permit Required Confined Space Program" is included as Appendix 9. This appendix is required reading for all supervisors and foremen who have or may have workers entering confined spaces. Reading and understanding this program is essential because J.J. White, Inc. has the ultimate responsibility for its workers. This program should be used either when the Owner does not have a program or in conjunction with the Owner's program.

A confined space entry permit is valid for one shift only and must be issued by an Owner's representative. When a confined space has been prepared for safe human entry, the completed permit will be attached in a prominent location, preferably at the manway or the entrance into the confined space.

The permit governs the procedures by which the vessel is emptied, blinded, vented, and tested for oxygen content and presence of both toxic and explosive gases and vapors. The permit may contain specific requirements regarding hand tools, electrical safety, protective clothing such as gloves, coveralls, and respirators, and emergency equipment such as full-body harness with a mechanical retrieval system for vertical entries.

When sufficient ventilation cannot be obtained without blocking the means of access, airline respirators with 5-minute escape bottles will be used to protect the employees in the confined space. The need for fresh air should be discussed with both the Owner representative and a J. J. White, Inc. Safety Coordinator.

Note: Anytime that respiratory protection is required, please refer to the J. J. White, Inc. Respirator Program to verify that all requirements are being met.

Torches must be turned off outside confined spaces, at the compressed gas cylinders, when the torch is not in use, or when torches are left unattended for extended periods such as during lunch breaks. At the end of work shifts, torches and hoses shall be removed from the confined space, and fuel gas and oxygen hoses shall be immediately disconnected.

An attendant (standby person) must be in constant communication with the employee(s) in the confined space, and emergency rescue procedures must be reviewed before each entry. The attendant must know all of his/her duties and responsibilities prior to anyone entering the confined space. Refer to Appendix 9 – Permit Required Confined Space Program, for a list of the duties of the attendant.

21. Compressed Gas Cylinders

- A. Compressed gas cylinders in use shall be fastened securely with chain, in an approved cylinder cart in an upright position.
- B. Welding trucks are only permitted to transport compressed gas or breathing air cylinders in the trucks' permanently mounted bottle rack(s).

- C. Oxygen cylinders must be stored in a safe, well-ventilated place separated from fuel gas cylinders by a minimum of 20 feet or a ¼" steel plate barrier. Full and empty cylinders shall not be moved without the safety caps screwed on.
- D. All Grade D breathing air will be from cylinders or tank trucks – no other sources are acceptable. A Certificate of Analysis (COA), from the supplier, shall be available for all breathing air bottles.

22. Hand Tools

Hand tools are the source of 6% of all disabling injuries including loss of eyes and vision, puncture wounds from flying chips, severed fingers and arteries, broken bones and severe contusions, and infections from puncture wounds.

General Safe Handling Practices

- Use tools (especially power tools) only after proper training
- Use tools correctly
- Wear approved eye protection
- Keep tools in good condition and in a safe place
- Keep all safety guards on tools to prevent injuries

Non- Powered Hand Tools

- Wrenches shall not be used when jaws are sprung to the point that slippage occurs
- Impact tools (wedges, chisels) shall be kept free of mushroomed heads
- The wooden handles on tools shall be kept free of splinters or cracks, and shall be kept tight in tools.
- Never use screwdrivers as punches, wedges or pinch bars
- Always use the proper type of hammer

Powder-Operated Tools

- Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a powder driven tool.
- All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

Power-Operated Hand Tools

- Portable electrical tools shall not be used unless they are equipped with grounding or "third wire" connections, or the double insulated type, along with explosion proof plugs.
- Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.

23. **Fall Protection (Full-Body Harness and Lanyard)**

On February 6, 1995, OSHA's Fall Protection Standard 1926.500 became effective.

Accordingly, all J. J. White, Incorporated personnel exposed to a fall hazard of **6' or more** shall be protected from a fall by one of the following conventional fall protection systems:

- A Guard Rail System (top rail at 42" (+/-3"); mid-rail at 21" (+/-3") and a 4" toe plate).
- A Personal Fall Arrest System (Full body harness, shock absorbing lanyard with double locking snap hooks and an anchorage capable of supporting a 5000 LB static load).
- A Safety Net System.

In addition, this Standard does not apply to: scaffolds, electrical transmission and distribution lines, steel erection, cranes and derricks, tunneling stairways and ladders.

Fall Protection for these activities are addressed in their own respective OSHA standards.

OSHA 29 CFR 1926.500 allows some very narrow exceptions to conventional fall protection systems when it is found that the standard systems are "infeasible". However, the J. J. White, Incorporated Safety Coordinator must be notified **before** anyone is exposed to an unprotected fall greater than 6'. A plan will then be formulated to allow work to progress safely.

As noted earlier, only full body harnesses and shock absorbing lanyards with double locking snap hooks are permitted. Anchorages must be carefully selected to assure they can support a minimum static load of 5000 lbs. When necessary, high line cable installations may be required to provide an anchorage for tie-off.

All components of Personal Fall Arrest Systems must be inspected daily, by the user, for cuts, frays or other visible signs of wear.

Guard Rail Systems may be constructed of 2" x 4" (Nominal) construction grade lumber or 2" x 2" angle iron.

All persons required to wear and use a personal fall protection system must be trained and a written certification record must be prepared and maintained.

Following are examples of when fall protection may be required.

- Sloping roofs
- Flat roofs if working without handrails, within 10 feet of the roof edge
- Elevated open-sided floors or platforms
- Suspended scaffolds, platforms or stages
- Any yellow tagged scaffold
- All steel erection projects

24. Floor and Wall Openings

Floor openings shall be securely covered or protected by hand rails. Wall or floor openings from which there is a drop of more than six feet shall be protected as specified by the OSHA standards.

Equipment or material shall not be stored on a hole cover. All hole covers must extend adequately beyond the edge of the hole and be bolted down so they do not slip. All hole covers must be labeled "Hole Cover."

Stairways, ladders or ramps must be provided during the construction period for structures of two or more floors in height, for any change in elevation greater than 19".

For more details information please refer to the J. J. White, Inc. Job Hazard Analysis Manual – JHA-021 – Guarding (Floor Wall & Roof) Openings.

25. Scaffolding

Scaffolds shall be erected in accordance with all applicable OSHA standards. No scaffolds shall be erected, moved, dismantled, or altered except under supervision of a scaffold competent person. Refer to the J. J. White Inc. Scaffolding Program, included as Appendix 10.

The scaffold tagging system works as follows:

- All scaffolds must be tagged with either a Red, Yellow, or Green tag.
- Green Tag indicates that the scaffold meets all of OSHA's criteria for strength and fall protection. No fall protection harness is required unless your feet leave the scaffold decking and you lose the protection of the handrails.
- Yellow tag indicates that the scaffold is structurally sound but has some hazard associated with it. It may be that the handrails were removed or a section of planking is missing from the deck. Whatever the case may be, if you are on a yellow-tagged scaffold you must have a fall protection harness on with lanyard(s) and you must be tied off if you are above 6'.
- Red tag indicates that the scaffold is either being erected, modified or being dismantled. No one is to climb on or work on a red-tagged scaffold.
- A competent person must inspect all scaffolds prior to the start of each shift. The tagging on the scaffold must have a current inspection date before the scaffold can be used.
- Except for scaffolding competent carpenters, no one is permitted to alter any scaffold for any reason.
- An untagged scaffold is considered to be a red tagged scaffold.

An alteration may require a change in tagging or create an unsafe condition. Only scaffolding competent carpenters are qualified to build, alter or dismantle scaffolding on a job site.

Only J. J. White, Inc. employees, client representatives, and J. J. White, Inc. subcontractors can use the scaffold. Other contractors must sign a scaffold release form prior to using the scaffold. The form can be found in Appendix 10 – “Safety Program for Scaffolds.”

Additional information on scaffold competent person training may be obtained from the J.J. White, Inc. “Scaffold Competent Person Training Module.”

26. Ladders

The cause of a large number of all ladder accidents is the ladder “slipping”, or the feet sliding out from their position. The following actions will minimize the potential for “ladder slipped” accidents and injuries:

- Place the ladder feet on a substantial base and the area around the top and bottom of the ladder shall be kept clear.
- All ladders must be tied off at or near the top whenever possible.
- Use ladders with non-slip feet for level surfaces.
- Nail a scab or cleat at the base of solid wood decks and landings when tie-off is not possible. In lieu of nailing a cleat, another individual can be used to hold the ladder in place.
- Use the proper ladder pitch so that the horizontal foot of the work is about one quarter of the working height of the ladder (4:1 Rule).

The following practices should also be used to prevent other types of ladder accidents:

- Do not use ladders with broken or missing rungs or steps, or split side rails.
- Ladders shall not be used in a horizontal position as platforms, runways or scaffolds. Job made ladders shall be in compliance with OSHA requirements.
- Ladders, tools, equipment, etc., used shall be maintained in a condition that will not constitute a hazard to personnel.
- Do not hand-carry tools (use hand line and container). Use a hand line to raise and lower materials.
- Metal ladders shall not be used for electric welding, or near electric lines.

- Remove grease, mud, snow, ice, and water from rungs and side rails to help prevent slipping accidents.
- Do not hurry up and down ladders or use sudden, excessive forces while standing on a ladder.
- Have two people handle long, heavy ladders to prevent overexertion injuries.
- Inspect ladders for defects or damage and verify non-skid feet on all ladders.
- Do not use stepladder as a straight ladder. Open the stepladder completely and lock the spreaders.
- Keep your body between the side rails, and move the ladder frequently to avoid accidents associated with over-reaching.
- Always maintain three points of contact while climbing on any type of ladder.

27. Cranes and Hoists

Authorized Personnel – Only authorized crane operators are permitted to operate a crane or to enter the cab of a crane.

Capacity – Each crane and hoist must have its rated safe load capacity painted on both sides in figures readable from ground level. *Note that the overall capacity of the crane is the lowest number of its individual rated components.*

Load Testing – All cranes and hoists (lifting devices) shall be certified Proof Load Tested at the factory prior to first use. Proof testing of lifting equipment must be repeated after alteration, modification, or reassembly, or prior to unusual or critical lifts or load-bearing or load-controlling parts.

Inspections – All crane components and rigging equipment shall be inspected before each use and at regular intervals as recommended by the crane manufacturer.

General Safe Handling Precautions:

- Employees shall not ride upon any cranes except in the approved protected seats provided. Employees shall not ride crane loads, or the hook under any circumstances.
- All slings, chokers, ropes, hooks, etc. shall be sized as per OSHA charts.
- All lifts of unusual nature or over 40 tons in weight shall require that a lift plan be created and reviewed by the project superintendent and safety coordinator.

- No guard, safety appliance or device on cranes or hoisting equipment shall be removed, bypassed, or otherwise made ineffective.
- Barricades and warning signs shall be used, as appropriate, to restrict pedestrians and vehicles. Occupants of buildings must be evacuated if any part of the crane will swing over a building.
- Loads shall not be lifted unless the crane hook is located directly over the load. Any deviation from a vertical lift will cause the load to swing when it clears the resting surface.
- At no time shall a load be left suspended from the crane unless the operator is at the master switches or push-button with the power on. When the crane is holding the load, the crane operator must remain at the controls.
- Loads shall be lifted slowly to prevent snapping of chains and/or slings.
- Loads shall be lowered slowly and steadily.
- Loads shall not be moved over personnel or aisles.
- All crane lifts shall be stopped during high winds in excess of 25 mph.
- **All loads shall be controlled through the use of tag lines, and all employees handling tag lines are required to wear the minimum PPE of a hardhat, safety glasses and gloves, without exception.**

28. Manbaskets

This procedure describes some general safety practices that must be followed when using the Company's Lifting Technologies, Inc. manbasket(s). Refer to the "Lifting Technologies, Inc. Manbasket Use and Safety Handbook", included as Appendix 11, and the J. J. White, Inc. Job Hazard Analysis Manual – JHA-023 – "Personnel Lifting Baskets" for additional information. The following rules apply:

- Only authorized and qualified employees can use the manbasket.
- All personnel who are involved with the lifting operation, including, but not limited to, the crane operator, mechanics, foreman, etc., will attend a pre-lift meeting to review the tasks and hazards of the operation.
- Always inspect manbasket for deficiencies prior to use. Never use a damaged crane or manbasket. Never modify a manbasket.
- The weight of personnel and tools must not exceed rated capacity.
- Always wear a full-body harness and lanyard in the manbasket.

- 100% tie-off must be maintained at all times.
- Always attach the lanyard to the lower load block or overhaul ball. Do not attach your safety lanyard to an adjacent structure.
- Never sit, stand, or climb on the manbasket railing.
- Never use the manbasket if it has not first been subjected to a trial lift.
- **Do not use the manbasket as a convenience elevator.**

29. Excavations

This procedure describes some general safety practices that must be followed for excavation operations. Refer to the *“OSHA Construction Standard for Excavations”*, included as Appendix 12, and the J. J. White, Inc. Job Hazard Analysis Manual- JHA-020 – “Excavations”, for additional information. The following rules apply:

An organization specializing in the notification of utilities for line verification purposes, such as PA One Call or Miss Utility must be used for all excavations (refer to item 30).

All ditches and excavations more than five feet deep shall be shored solid unless the excavation or ditch walls are sloped to the natural angle of repose of the material being excavated. Soil conditions must be assessed daily by a competent individual to determine the required type of bracing and shoring.

All excavations greater than four feet in depth will be considered a permit required confined space. All associated procedures must be followed to ensure the safety of all personnel involved and compliance with applicable regulations. Please refer to item 20 for more specific information on Confined Space Entry.

All materials used for shoring shall be designed in compliance with OSHA and state laws. Excavated material shall be placed or piled so as not to block access to equipment, buildings, roads, fire and safety equipment, etc. during the progress of the work. The spoil banks should be retained at least two feet from the edge.

A stairway, ladder, or ramp is required for trenches greater than 4 feet deep, and a ladder or other means of access or egress must be provided for every 25 feet of lateral travel. Walkways with standard handrails must be provided at any point where employees cross over the trench. Employees are not permitted underneath loads handled by lifting or digging equipment. Barricades (lighted barricades at night) must protect the trench.

30. One-Call Notification Systems

Due to the amendments to the Pipeline Safety Act and its provision for increased fines and imprisonment, J. J. White Inc. requires anyone doing excavations to use a “One-Call System” or utility locating service.

To use the utility locating service, the following procedure is to be followed as a guideline. Check with the appropriate organization for the State you are performing work in.

- Plan Ahead – Unless it is an emergency, all of the organizations require no less than three days notice. At the time of the call, you will be given an identification number. It is absolutely essential that this number be recorded and kept on file. It is your proof that a call was made to the utility locator.
- The pipeline or utility owners then have 48 hours to verify whether or not they have service in the area of the excavation.
- In the unlikely event that no utility companies respond, on the third day you must re-call the locator service and let them know. You will be issued another identification number and the utility now bears the liability for the excavation should a mishap occur.
- The number for the states that J. J. White, Inc. performs work in is **811**.
- When you Call, you will supply them with:
 - Company name and address (J.J. White Inc.)
 - Location of excavation, drilling, or blasting
 - Time and date of intended work
- When an utility or pipeline owner marks an area where there is service, the following color code will be used:

| | | |
|----------|---|---------------------|
| ○ Red | = | Electric |
| ○ Orange | = | Communications |
| ○ Blue | = | Water |
| ○ Green | = | Sewer |
| ○ White | = | Proposed Excavation |

Please see Appendix 13 – “One-call Systems for Excavations” for additional information.

31. Powered Industrial Tools

Employees who operate forklifts, including rough terrain forklifts, must be trained and have a valid driver's license, a good driving record, and good vision, hearing, and reaction times. The following safety precautions apply to all forklift operators:

General:

- Never exceed the rated load limit
- Handle only stable loads
- Place forks under the load as far as possible, tilt mast backward
- For stability, keep the load close to the front wheels, and as low as possible
- Before raising a load, always check for overhead clearance
- Block and chock when done

Elevating a Load:

- Do not raise/lower forks unless lift truck is stopped and the parking brake has been applied.
- Always lift load straight up or tilted slightly back
- Do not lift load above height of the backrest

Moving a Load:

- Keep the forks 6 to 10 inches off the ground
- Never travel with the load elevated
- Be sure your vision is not blocked by the load
- Drive slowly and avoid sudden starts and stops
- Beware of pedestrians – slow down and sound the horn at all intersections and blind corners
- When driving in reverse- face to the rear and sound the horn before moving.

General Safety Rules:

- Never block fire aisles, emergency exits, fire equipment
- Always carry a charged fire extinguisher on the lift truck
- Keep hands, arms, legs, and feet inside the confines of the lift truck
- Passengers are prohibited on the lift truck
- No one is permitted to stand or walk under the elevated part of the lift truck
- Immediately report any collision or damage

Inspections:

At the beginning of each shift, or the first time you use a lift truck during the shift, conduct a safety check of the following:

- Horn; flashing light; brakes; steering; hoses; lift system; fire extinguisher
- Battery- follow manufacturer's instructions to change batteries- no smoking or open flames in the battery charging area – never connect the battery charger to the motor – wear appropriate protective clothing!!

32. Back Injury Prevention

Back injuries occur when employees manually lift, lower, push, pull, or carry materials that are too heavy or too bulky to move. The following material handling skills should be used to prevent work-related back injuries, shoulder strains, and other muscle sprains and strains.

- Keep the object close to the body when lifting, lowering, and carrying.
- Keep all movements in front of the body (avoid twisting). Research has shown that the majority of back injuries occur when lifting is combined with twisting of the upper body.
- Avoid lifting from the floor (minimize bending while lifting).
- Avoid lifting above shoulder height.
- Avoid excessive or prolonged bending, reaching, or stooping. These adverse postures can cause injuries associated with muscle tightness and cramping.
- Use smooth, steady motions to lift, lower, push, and pull objects.
- Use two hands and a firm grip to lift, lower, push, pull, and carry materials.
- Avoid walking when lifting – lift first, then take a step.
- Get help or use materials handling equipment to move heavy loads.
- Maintain good physical fitness with proper diet and exercise (keep the abdominal muscles strong to reduce strain to the back muscles).

Remember to always stay within your strength limits when lifting materials. Always test the weight of materials you will be lifting, and do not lift materials that you feel are too heavy or too bulky to handle comfortably. Always get help or use materials handling equipment to move the heavier/larger materials. **Use your brain – not your brawn!**

IN-PLANT AND PROCESS SAFETY

1. In-Plant Safety

In addition to J.J. White, Incorporated Safety Program, all employees must comply with the Owner's Safety Programs, which are particular to their own operations, policies and procedures.

2. Process Safety

Employees must be aware of the following safety items if the job is at a facility, which uses highly hazardous materials in their process operations:

- A. The specific safe work practices necessary to safely perform his/her job, such as lockout/ tagout, confined space entry, opening process equipment or piping, and security requirements (entry, presence, and exit of contract personnel) in the processing areas.
- B. The known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the owner's emergency action plan.
- C. The need to follow the owner's safety rules and safe work practices.
- D. The need to advise their job foreman or superintendent of any unique hazards presented by their work, or of any hazards identified during their work activities.
- E. Effective January 1, 1995, all Delaware Valley Refineries will require all crafts personnel to possess a PSM photo I.D. card to gain entrance to the Refineries. These cards are issued by the individual's Union after completion of training and successful testing in the "Process Safety Management" Course.
- F. All employees must possess a valid TWIC card for access to facilities under Coast Guard jurisdiction.

3. In-Plant Safety Training Orientations

In addition to the training provided by the Company, many Owners provide a general safety orientation to review the Owner's safety programs and applicable process safety work practices. Certain Owners require that all contract employees pass a safety competency test prior to working at the job-site.

Employee Responsibilities

It is the responsibility of all J. J. White employees to attend the Owner's safety orientations, pass the safety competency test, and to request additional information from their job foreman, superintendent, or the Owner if they have any questions or concerns regarding the safety of the Owner's processes or facilities.

APPENDIX 1

DISCIPLINARY POLICY FOR SAFETY VIOLATIONS



J. J. White, Inc.

Disciplinary Policy

Introduction

OSHA citations have been increasing for employers who have no **enforced** disciplinary policy. In addition, more of our customers are insisting on a workforce that is more aware of safe work practices and procedures. The use of a consistent and fair disciplinary policy can increase safety awareness and enhance the overall effectiveness of the company's safety program. Employees and the company will benefit from:

- Less accidents, injuries, pain and suffering;
- Compliance with OSHA regulations; and
- A more competitive company through decreased medical and insurance costs and fewer workers' compensation claims.

There are two important issues to be aware of when implementing this policy:

1. It must be used **Consistently** to be effective!
2. It must be implemented **Fairly**!

It is imperative that all employees are looked at and dealt with in the same even-handed manner, regardless of sex, race, age, or physical abilities. If this policy is not applied fairly, you may subject yourself and J. J. White Inc. to charges of discrimination.

Please note that all written warnings, unpaid suspensions, and terminations from employment require the employee's signature on the Disciplinary Form. This form will then be forwarded to J. J. White, Incorporated's main office where it will be placed in the employee's personnel file.

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Failure by the cited employee to acknowledge, via signature, the Disciplinary Form may result in further disciplinary action, up to and including termination of employment.

The following disciplinary procedures are based on any infraction of J. J. White Incorporated or the Owner's work or safety rules.

There are three (4) steps/levels to the disciplinary procedure:

1. **Level "A":** Immediate termination from employment, with potential for ineligibility of rehire.
2. **Level "B":** First infraction will result in unpaid time off. The amount of time will be based on the severity of the infraction. A minimum of one (1) working day and a maximum of three (3) working days. Additional citations of this type will result in termination from employment.
3. **Level "C-2":** Second infraction equals a written warning. Additional citations of this level may result in an unpaid time off or termination of employment.
4. **Level "C-1":** First infraction equals a verbal warning. Additional citations of this level will result in a written warning.

The following examples and notes listed below are for further clarification of this policy.

Safety Violations

OSHA requires all companies to have a written safety program clearly stating what acceptable safe work practices are. To measure a company's commitment to its own written Safety Policy, OSHA will look for a written, documented, and enforced Disciplinary Policy. Without an **enforced** policy, OSHA will consider the safety program ineffective. Accordingly, the following disciplinary program will be maintained.

Examples of a Level "A" citation are as follows, where a violation of one of the following rules of conduct by an employee is considered inexcusable and can result in immediate termination from employment:

1. Leaving an occupied confined space unattended.
2. Removing airlines being used for Confined Space Entry ventilation without notifying entrants and standby personnel.
3. Leaving a fire watch position unattended while hot work is being performed.
4. Circumventing existing LO/TO procedures
5. Knowingly moving under or standing under a suspended load.

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6. Smoking in an unapproved area.
7. Moving from one spot to another at an elevation when exposed to an unprotected fall and not utilizing 100% Tie Off techniques.
8. Entering confined spaces without a permit, without qualified standby personnel, or without the proper personal protective equipment.
9. Performing work without the required permit.
10. Working, or allowing work, in an improperly shored excavation.
11. Improper towing of equipment.
12. Supervision witnessing and/or condoning an unsafe act, that is considered a Level “A” infraction, and failing to take any action to stop it.
13. Any safety violation which results in the creation of an imminent danger to life and health of any individual.

Examples of a Level “B” citation are as follows, where a violation of one of the following rules of conduct by an employee is considered Serious Misconduct, and will result in a one (1) to three (3) day suspension, without pay. Additional violations may result in immediate termination of employment.

1. Failure to follow LO/TO procedures.
2. Failure to de-energize welding leads and lights during roll back and relocation.
3. Failure to use tag lines on suspended loads.
4. Failure to wear specified PPE while performing tasks.
5. Driving a company vehicle in an unsafe manner on a public highway or in a client’s facility (i.e. speeding, failing to stop at a stop sign or red light). This may also include loss of use of company vehicle privileges, as outlined in the Company Fleet Safety Program.
6. Using electrical equipment without a Ground Fault Circuit Interrupter (GFCI).
7. Grinding without a face shield and safety glasses or monogoggles.
8. Grinding without a grinder guard or altering a safety device.
9. Use of a cheater device to gain leverage on wrenches.
10. Improper ladder use.
11. Working at elevation without fall protection.

Disciplinary Policy – J.J. White, Inc.

12. Supervision witnessing and / or condoning an unsafe act, that is considered a Level “B” infraction, and failing to take any action to stop it.
13. Causing any at-fault accident while operating a Company vehicle.

Examples of a Level “C” citation are as follows, where a violation of one of the following rules of conduct by an employee is considered Minor Misconduct. A written warning would be issued to the employee. Additional violations may result in suspension from work, or immediate termination.

1. Not wearing hearing protection where required by permit or in high noise areas.
2. Not wearing Safety Glasses.
3. Not wearing the J. J. White, Inc. issued MSA hardhat, bill facing forward, or the J. J. White Inc., issued fibre metal hardhat for welders (when welding only).
4. Not wearing leather work gloves where and when appropriate.
5. Not wearing seat belts while in a moving J. J. White Inc. vehicle where seat belts are available.
6. Nomex sleeves rolled up or the zipper unzipped.
7. Using the incorrect tool for the job. (i.e. using a screwdriver as a pry bar, using homemade tools, using defective/broken tools)
8. Occupying a scaffold that had not been inspected by a competent person and tagged that shift.
9. Supervision witnessing and/ or condoning an unsafe act, that is considered a Level “C” infraction, and failing to take any action to stop it.
10. Any moving violation while operating a Company vehicle.

Violation of Work Rules

Examples of a Level “A” citation are as follows, where a violation of one of the following rules of conduct by an employee is considered inexcusable and can result in immediate termination from employment:

1. Sleeping during working hours.
2. Insubordinate behavior.
3. Fighting or any other form of workplace violence including physical, or verbal threats of violent nature, or with a violent intent.
4. Stealing.

Disciplinary Policy – J.J. White, Inc.

5. Misrepresentation or falsification of records or time reports.
6. Deliberate damage to the property of the Company, its employees, or others doing business with the Company.
7. Violation of any criminal laws, which affects the employee's work performance, availability or suitability for his/her job.
8. Inappropriate hampering of production.
9. Organizing, participation, or conducting gambling activities.
10. Immoral, obscene, or indecent conduct, including acts of discrimination. Additionally, possession of any material, considered pornographic in nature, while at the job site or during working hours.
11. Actions, or failure to act, which results, or could result in injury to persons, damage or loss to property, products or the environment.
12. Leaving the job or work area where relief is required without permission or relief.
13. Reporting to work, or being at work while under the influence of illegal drugs, as defined in the Company and/or Owner's substance abuse policy, or alcohol.
14. Manufacturing, dispensing, selling, buying, offering for sale illegal drugs, as defined by the Company and/or Owner's substance abuse policy, on either the Company or Owner's premises, or while on Company business when away from the Company premises.
15. Using or possessing, on Company and/or Owner's property, any illegal drugs, or alcohol, as defined by the Company and/or Owner's substance abuse policy.
16. Manufacturing graffiti on any Company and/or Owner's property while on or off of the Company or Owner's premises.
17. Supplying any misrepresentation of facts during an accident investigation, safety violation or near-miss investigation.

Disciplinary Policy – J.J. White, Inc.

Examples of a Level “B” citation are as follows, where a violation of one of the following rules of conduct by an employee is considered Serious Misconduct, and will result in a one (1) to three (3) day suspension, without pay. Additional violations may result in immediate termination of employment.

1. Harassing, threatening, or coercing others; using abusive or threatening language.
2. Concealing defective work.
3. Wasting materials or abusing tools, equipment, or any other property of the Company and/or of the Owner.
4. Hiding or Concealing Company property and the property of others.
5. Playing pranks (horseplay) or malicious mischief.
6. Violation of security regulations.
7. Leaving the job or work area without permission of supervision where relief is not required.
8. Failure to report off according to established rules, including acts of repeated tardiness.

Examples of a Level “C” citation are as follows, where a violation of one of the following rules of conduct by an employee is considered Minor Misconduct. A written warning would be issued to the employee. Additional violations may result in suspension from work, or immediate termination.

1. Posting unauthorized notices, defacing walls or tampering with bulletin boards.
2. Tardiness and/or absence from assigned work without satisfactory excuse. This will also result in a partial loss of wages for that shift.
3. Creating or contributing to unsanitary conditions or poor housekeeping.
4. Mistakes due to carelessness or inattentiveness to job.
5. Selling, soliciting, canvassing, or distributing articles or literature without Company permission.
6. Improper parking of a vehicle on Company and/or Owner’s premises. See Company Fleet Safety Policy for greater detail.
7. Failure to adhere to reasonable standards of courtesy, including insubordination, and failure to be considerate of the rights of others, including fellow employees.

Disciplinary Policy – J.J. White, Inc.

Below are listed some additional notes regarding the J. J. White, Incorporated Disciplinary Policy that should be considered when the issuance of a citation becomes necessary.

1. It is impossible to compile a complete summary of violations requiring disciplinary action. Consequently, violations requiring disciplinary action include, but are not necessarily limited to, those listed herein. For example, sexual harassment is covered by a separate Company policy. However, the violations and penalties listed here do provide a basic pattern for such action. Termination from employment, arising from disciplinary action, may result in an employee being ineligible for unemployment benefits.
2. The Company reserves the right to impose penalties different than those listed herein, depending upon the nature of the circumstances involved in each individual case, if any.
3. The rules are designed to insure an orderly, efficient, and harmonious work environment for all employees. All discipline actions will be considered cumulative, and on imposing discipline, the Company may consider prior violations and penalties.
4. Discipline for absence is administered under the General Work Rules.
5. Discipline for company vehicle violations is administered under the Company Fleet Safety Program.
6. If an employee incompetently performs his/her duties, he/she shall be so warned in writing. If his/her work performance remains unsatisfactory due to his/her continuing incompetence, appropriate action will be taken up to and including termination of employment.

Implementation

1. **Responsibility:** Disciplinary action shall be handled and administered in the same manner each and every time. The Site Superintendent takes overall responsibility for the use of the Disciplinary Policy on their project. The following have the responsibility of familiarizing themselves with this policy and consistently enforcing it on our projects.
 - Project Manager
 - Site Superintendent
 - Safety Professional
 - General Foremen
 - Area Foremen
 - Foremen

Disciplinary Policy – J.J. White, Inc.

2. **Process:** Disciplinary action will be distributed in accordance with the above stated Levels and consequences. If an employee is observed violating a Level “C” infraction then that employee will receive a “Verbal” warning that will be documented and recorded as such. The employee and foremen will be responsible to document that the “Verbal” warning was given and that the next infraction of this same Level will result in a formal “Written” warning. Further infractions of this same Level will then be treated as “B” and then “A” violation.

If an employee is observed violating a level “B” infraction then the employee will receive written notification of this accompanied by 1-3 days off unpaid. The Executive Vice President, Senior Vice President, Director of Risk Management or the Corporate Safety Director will determine the number of days off unpaid based on the severity of the violation, or any past history. This will ensure the Disciplinary action is being distributed consistently and fairly. Further infraction of this same Level will then be treated as “A” violations resulting in termination of employment.

Level “C” violations (written and verbal) will remain on an employee’s record for a one year period. If after one year the employee receives no further Disciplinary Forms the infraction will drop off and will not be held against them.

Level “B” violations (1-3 days off) will remain on an employee’s record for a one year period. If after one year the employee receives no further Disciplinary Forms the infraction will be reduced to a Level “C” and completely off the record after a two year period.

All Level “A” Violations will results in immediate termination. Employee reinstatement will not be allowed for at least a one year leave of absence. The Executive Vice President or the Senior Vice President will need to approve the reinstatement of any employee.

3. **Procedure:**

1. The person who observed the action in violation is responsible to gather the employee’s name, the date and time which the violation occurred, witnesses and which specific requirement was violated.
2. This information is then to be forwarded up through the chain of command and make its way to the Site Superintendent and Safety Department.
3. Disciplinary Forms are **ONLY** to be written by the Director of Risk Management, Corporate Safety Director, Field Services Administrator, or Site Superintendent.
4. The final Disciplinary Form will then be forwarded to the appropriate General Foremen or Foremen to be signed and issued to the employee.
5. All signed and completed forms shall be sent to the Field Service Administrator for final recordkeeping.

Disciplinary Policy – J.J. White, Inc.

4. **Records:** Records will be maintained in the employee's personnel files at the main office. A log of all Disciplinary Actions issued will be logged and tracked to ensure the consistency and fairness of the program.

APPENDIX 2
OCCUPATIONAL INJURY REPORTING FORM
(OSHA FORM 301)

To: All J. J. White, Incorporated Superintendents

From: James Daley

Subject: **Employer's Report of Occupational Injury or Disease Form**

In the event of an injury, no matter how minor, it is critical that the job site superintendent immediately, upon being notified of the same, obtain all information required to complete the attached form. While this information is being obtained, the superintendent is also to contact the Vice President of Risk Management. All information should then be immediately given to the Vice President of Risk Management, who will then complete the Employer's First Report of Injury form. This form is to be used for all J. J. White, Incorporated employees injured while in the course and scope of employment.

If the J. J. White, Incorporated employee is injured while working on a project with an Owner Controlled Insurance Program "OCIP", then the Vice President of Risk Management will complete whatever additional reporting requirements may be required under that particular OCIP. However, the Superintendent will still be required to obtain all of the same information as if a Standard Employer's Injury Report Form was being completed. This information is, as above, to be immediately given to the Vice President of Risk Management.

If you should have any questions regarding the completion of any section of either of these forms, please contact Bill Nolan Risk Manager at (215) 722-1000 or 215-301-2422.

Lastly, all reports are to be reviewed by the Risk Manager prior to being released to any non- J. J. White, Incorporated personnel – No Exceptions!

blank

OSHA's Form 301

Injury and Illness Incident Report

Note: You can type input into this form and save it. Because the forms in this recordkeeping package are "fillable/writable" PDF documents, you can type into the input form fields and then save your inputs using the free Adobe PDF Reader. In addition, the forms are programmed to auto-calculate as appropriate.

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.



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

Form approved OSHA no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy the printout or insert additional form pages in the PDF, and then use as many as you need.

Information about the employee

- 1) Full name _____
- 2) Street _____
- 3) City _____ State _____ ZIP _____
- 4) Date of birth _____
Month Day Year
- 5) Date hired _____
Month Day Year
☐ Male ☐ Female

Information about the physician or other health care professional

- 6) Name of physician or other health care professional _____
- 7) If treatment was given away from the worksite, where was it given?
Facility _____
Street _____
City _____ State _____ ZIP _____

- 8) Was employee treated in an emergency room?
☐ Yes
☐ No
- 9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

- 10) Case number from the Log _____ (Transfer the case number from the Log after you record the case.)

- 11) Date of injury or illness _____
Month Day Year
- 12) Time employee began work _____ ☐ AM ☐ PM
- 13) Time of event _____ ☐ AM ☐ PM ☐ Check if time cannot be determined

- 14) What was the employee doing just before the incident occurred? Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

- 15) What happened? Tell us how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

- 16) What was the injury or illness? Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or "sore." Examples: "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

- 17) What object or substance directly harmed the employee? Examples: "concrete floor"; "chlorine"; "radial arm saw." If this question does not apply to the incident, leave it blank.

- 18) If the employee died, when did death occur? Date of death _____
Month Day Year

| |
|------------------------|
| Completed by _____ |
| Title _____ |
| Phone _____ Date _____ |
| Month Day Year |

Page 1 of 1

Save Input

Add a Form Page

Reset

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a current valid OMB control number. If you have any comments about this burden estimate or any other aspect of this data collection, including suggestions for reducing this burden, contact U.S. Department of Labor, OSHA Office of Statistical Analysis, Room 10-6044, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

OSHA's Form 301

Injury and Illness Incident Report

Note: You can type input into this form and save it. Because the forms in this recordkeeping package are "fillable/writable" PDF documents, you can type into the input form fields and then save your inputs using the [free Adobe PDF Reader](#). In addition, the forms are programmed to auto-calculate as appropriate.

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.



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Occupational Safety and Health Administration

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Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy the printout or insert additional form pages in the PDF, and then use as many as you need.

Information about the employee

- 1) Full name _____
- 2) Street _____
- 3) City _____ State _____ ZIP _____
- 4) Date of birth _____
Month Day Year
- 5) Date hired _____
Month Day Year
- ☐ Male ☐ Female

Information about the physician or other health care professional

- 6) Name of physician or other health care professional _____
- 7) If treatment was given away from the worksite, where was it given?
- Facility _____
- Street _____
- City _____ State _____ ZIP _____
- 8) Was employee treated in an emergency room?
☐ Yes
☐ No

- 9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

- 10) Case number from the Log _____ (Transfer the case number from the Log after you record the case.)
- 11) Date of injury or illness _____
Month Day Year
- 12) Time employee began work _____ ☐ AM ☐ PM
- 13) Time of event _____ ☐ AM ☐ PM ☐ Check if time cannot be determined
- 14) What was the employee doing just before the incident occurred? Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."
- 15) What Happened? Tell us how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."
- 16) What was the injury or illness? Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or "sore." Examples: "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."
- 17) What object or substance directly harmed the employee? Examples: "concrete floor"; "chlorine"; "radial arm saw." If this question does not apply to the incident, leave it blank.

- 18) If the employee died, when did death occur? Date of death _____
Month Day Year

Completed by _____

Title _____

Phone _____ - _____ - _____ Date _____
Month Day Year

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Save Input

Add a Form Page

Reset

APPENDIX 3

ACCIDENT INVESTIGATION REPORTING FORMS AND PROCEDURES

To: All J. J. White, Incorporated Superintendents

From: James Daley
President

Subject: Superintendents Accident Investigation Reporting Form and Injured Employee Information Kit

The **Superintendents Accident Investigation Reporting Form** is to be used any time one of the following incidents occurs:

- There is an incident involving the injury of a J. J. White, Incorporated employee where the injury may have been, or was the direct result of a third party (i.e., another Company or Contractor, Subcontractor, Owner or some other outside, non- J. J. White, Incorporated entity). Note that this form is to be completed, if these circumstances apply, in addition to the Employer's Report of Occupational Injury or Disease described in Appendix #2, and in addition to the employee being issued an Injured Employees Information Kit, described later in this Appendix section.
- An Auto accident of any type involving a J. J. White vehicle.
- Damage to, or theft of any J. J. White, Incorporated property or equipment, whether it was owned or rented.
- Damage to another party's property or equipment caused by the actions of J. J. White, Incorporated or Subcontracted personnel.
- Any incident that is qualified as a "Near Miss" in the causation of an accident involving J. J. White, Incorporated or Subcontracted Personnel.

Upon completion of this form, it should be sent immediately to the main office, to the attention of the Risk Manager. Additionally, notification of the accident should be phoned in to the Risk Manager at (215) 722-1000 or cell (215) 301-2422 when you are first advised of the incident so that you can be assisted in the investigation.

Lastly, all completed forms are to be reviewed by the Risk Manager prior to being released to any non- J. J. White, Incorporated personnel.

The **Injured Employee Information Kit** is to be utilized in the event of any injury incurred by a J. J. White, Incorporated employee.

After you, the superintendent, have completed the Employer's First Report of Injury or Disease, you will now obtain an Injured Employee Information Kit for explanation to the injured employee.

After you have opened the Injured Employee Information Kit, you will see that it contains the following:

- 1) A memo from James J. White, IV to the injured employee that explains the contents of the Injured Employee Information Kit.
- 2) A Injured Employee Accident Report questionnaire form (Envelope with return address is also provided).
- 3) A list of **ALL** J. J. White, Incorporated panel physicians (Not just the job site panel physician list).
- 4) A medical consent form.

Please now read the memo (No. 1 above) to the injured employee, and request that he take the time **NOW** to schedule a medical exam with one of the panel physicians (No. 3 above). Also at this time request the employee complete the enclosed questionnaire and medical consent forms and place them in the envelope provided with the return address, and forward along the same at this time.

Please now place the memo (No. 1 above), and panel physician list (no. 3 above) back into the Injured Employee Information Kit, and complete the notification card on the outside of the information kit, sign it, and have the employee sign it as well. You will then detach the white and yellow copies of the notification form, forwarding the white copy to the main office, to the attention of the Risk Manager, and retain the yellow copy for your record. The Employee Information Kit has a copy of the notification form permanently adhered to its reverse side for the employee's records, and the package will be handed back to the employee whom it was just explained to for their future use.

J.J. WHITE, INCORPORATED

Incident Investigation Report

General Information

(Please print all information below)

| | |
|--------------------------|--------------------------|
| Job Site: | Job Number: |
| Project Name: | Type of Incident: |
| Date of Incident: | Time of Incident: |

Specific Incident Description

(Please print all information below)

| | |
|--|--------------------------------|
| Describe Exact Location of Incident: | |
| | |
| List, by Name, Any Person(s) Involved, or, by Item, Any Material(s) Damage: | |
| | |
| Describe Specific Injury (ies), or Damage to Item(s): | |
| | |
| Owner Notified: | If Yes, Identify Below: |
| | |

J.J. WHITE, INCORPORATED

Incident Investigation Report Form

Specific Accident Details

(Please print all information requested below)

| Describe How Incident Occurred: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------|------------------------|-----------------------------|-----------------------------|--|--|----------------|--------------|---------------------|--------------------|------------------|-----------------|---------------------|----------------|------------------------|-----------|----------|------------------|---------------|------------------|-------------------|--------------------|---------------------|--------------|-------------|------------|----------|----------------|-------------|------------------|-------------------------|---------------------|--|----------|--------------------|---------------|----------------------|--|--|---------|------------------------|-------------------|--|--|--|--|--|-----------|--|--|--|--|--|------------------|
| List Any other Parties that were involved in the Incident, and How they were involved: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Describe What you Believed Caused the Incident (Attached copies of JSA & any Permits): | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Identify Direct Root Cause or Causes: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Direct Cause | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <ul style="list-style-type: none">For every investigation at least one root cause should be identified for each direct cause identified. Please denote your initial selection(s) using the letter "P" to reflect the selections are "preliminary". Final selections are to be denoted with an "X". | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th>Policies/Procedures</th><th>Training</th><th>Management</th><th>Preparation and Supervision</th><th>Instructions</th><th>Interface with Equipment and Work Area</th></tr></thead><tbody><tr><td>Wrong Revision</td><td>Not Provided</td><td>Lack of Enforcement</td><td>JSA/JHA Inadequate</td><td>No Communication</td><td>Hot Environment</td></tr><tr><td>No Procedure/Policy</td><td>Did Not Attend</td><td>Lack of Accountability</td><td>Walk Thru</td><td>Turnover</td><td>Cold Environment</td></tr><tr><td>Not Available</td><td>Teaching Lacking</td><td>Policy Not Strict</td><td>Employees Assigned</td><td>Complex Instruction</td><td>Display Poor</td></tr><tr><td>Steps Wrong</td><td>No Testing</td><td>Controls</td><td>No Supervision</td><td>Terminology</td><td>Slippery Surface</td></tr><tr><td>Not Req'd But Should Be</td><td>Continuing Training</td><td></td><td>Schedule</td><td>Timely Instruction</td><td>Body Position</td></tr><tr><td>Followed Incorrectly</td><td></td><td></td><td>Fatigue</td><td>Inadequate Instruction</td><td>Condition of Tool</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>Lightning</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>Equipment Status</td></tr></tbody></table> | Policies/Procedures | Training | Management | Preparation and Supervision | Instructions | Interface with Equipment and Work Area | Wrong Revision | Not Provided | Lack of Enforcement | JSA/JHA Inadequate | No Communication | Hot Environment | No Procedure/Policy | Did Not Attend | Lack of Accountability | Walk Thru | Turnover | Cold Environment | Not Available | Teaching Lacking | Policy Not Strict | Employees Assigned | Complex Instruction | Display Poor | Steps Wrong | No Testing | Controls | No Supervision | Terminology | Slippery Surface | Not Req'd But Should Be | Continuing Training | | Schedule | Timely Instruction | Body Position | Followed Incorrectly | | | Fatigue | Inadequate Instruction | Condition of Tool | | | | | | Lightning | | | | | | Equipment Status |
| Policies/Procedures | Training | Management | Preparation and Supervision | Instructions | Interface with Equipment and Work Area | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wrong Revision | Not Provided | Lack of Enforcement | JSA/JHA Inadequate | No Communication | Hot Environment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No Procedure/Policy | Did Not Attend | Lack of Accountability | Walk Thru | Turnover | Cold Environment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Not Available | Teaching Lacking | Policy Not Strict | Employees Assigned | Complex Instruction | Display Poor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Steps Wrong | No Testing | Controls | No Supervision | Terminology | Slippery Surface | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Not Req'd But Should Be | Continuing Training | | Schedule | Timely Instruction | Body Position | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Followed Incorrectly | | | Fatigue | Inadequate Instruction | Condition of Tool | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Lightning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Equipment Status | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Describe Safety Equipment in use at the time of the Accident: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Describe Any Unsafe Acts/ Unsafe Conditions that may have caused or contributed to the incident having occurred: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Treatment and Final Outcome: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Signature: Date: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

To: All J. J. White, Incorporated Superintendents

From: James Daley
President

Subject: **Injured Employee Information Kit**

Please take the time to review all of the enclosed materials of this kit within twenty-four hours of your injury.

The kit includes the following:

- 1) This memo which outlines the procedures you must follow and information you are to supply once an injury as occurred.
- 2) A Injured employee Accident Report Form.
- 3) A list of ALL J. J. White, Incorporated panel physicians (Not only the panel physicians posted for this job site).
- 4) A medical consent form.

After you have had the opportunity to review all of these items, please schedule an appointment with one of the panel physicians as soon as possible. Then notify the Risk Manager at the main office of J. J. White, Incorporated located at 5500 Bingham Street, Philadelphia, PA 19120, telephone number (215) 722-1000 or cell (215) 301-2422 with the name of the panel physician with whom you have scheduled an appointment, as well as, the time and date the appointment has been scheduled.

Additionally, please complete all information requested on the Employee Accident Report Form, sign it, and return it along with a signed copy of the medical consent form to the Risk Manager at the above noted address, using pre-addressed envelope provided.

Lastly, if you have any questions on the procedures or information being provided or requested of you, please contact the Risk Manager immediately.

I thank you in advance for your attention to this matter.

J. J. WHITE, INC. EMPLOYEE INCIDENT NOTIFICATION CARD

Job Site Number _____

Corporate Number

Employee Name _____

1001

Date of Injury _____

Superintendent's Signature _____

Date _____

Notice to Employee:

I have been advised of the information contained within this envelope by my Superintendent (above) and understand that I am required to seek medical treatment with a physician of my choice from the list of Panel Physicians contained herein for treatment for possible injuries which may have occurred as a result of this incident. Failure to do so will be noted in the determination of the compensability of my claim.

Injured Employee's Signature

Date

| | |
|--------------------------|--|
| <input type="checkbox"/> | Check here if injured employee refused to sign |
|--------------------------|--|

| | |
|--------------------------|--|
| <input type="checkbox"/> | Check here if mailed to injured employee |
|--------------------------|--|

FORWARD THIS RECEIPT TO THE MAIN OFFICE



APPENDIX 3

ATTACHMENT "A"

Injury Kit Pa.



J. J. White, Incorporated
Instructions for Completion of the Injury Kit

- 1) Prompt and proper treatment of the employee's injury is always our first concern – this paperwork comes second. However, if the injuries require treatment at a medical facility other than our normal occupational health facility, the Safety Coordinator or Superintendent reporting the claim should complete the Workers' Compensation Authorization Form and give it to the person accompanying the injured employee and instruct them to give it to the front desk at the emergency room or the doctor's office. This is an attempt to avoid having the injured employee's credit negatively affected when the medical provider fails to bill us for the services rendered.
- 2) If the injury does not require emergency treatment, have the employee read and complete the forms in the following order: 1) Rules for Employees Injured On-the-Job, 2) Injured Employee Accident Report, 3) Medical Consent Form and 4) Employee Notification & Acknowledgement Form (Pennsylvania only). If the incident occurs in Pennsylvania, you must give the injured employee a copy of the Panel Physical List that is posted for your location.
- 3) **If an injured employee declines medical treatment at this time, he/she MUST still complete the Rules for Employees Injured On-the-Job and the Injured Employee Accident Report. There will be no exceptions.**
- 4) If the employee **will not be** going to one of our normal occupational health clinics (i.e. Christiana, Riverfront, Park Care or WORKNET), the Safety Coordinator or Superintendent should complete the Workers' Compensation Authorization Form and give it to the employee to give to the appropriate person at the doctor's office.
- 5) After the employee has completed the necessary forms, be sure that they understand everything and make sure that they have signed and dated each of the forms. Give the injured employee a copy of the Rules for Employees Injured On-the-Job and the Employee Notification & Acknowledgement Form (Pennsylvania only). Send the completed forms (including a copy of the employee's photo ID) to Robert Celestino, Director of Risk Management at 5500 Bingham St., Philadelphia, PA 19120 as soon as possible.
- 6) Once the employee returns, send an e-mail Bill Nolan (wnolan@jjwhiteinc.com) with the completed Workers' Compensation Initial Treatment Results form attached. If you do not have access to e-mail, fax the form to (215) 745-8076. If the employee will be on Modified Duty for longer than 2 weeks, or if he/she may be temporarily re-assigned to another location due to the physical work restrictions, the Superintendent or Safety Coordinator will give the employee a blank copy of the Work Rules for All Union Employees on Temporary Modified Duty and tell him/her to read the rules carefully. If the employee will be temporarily re-assigned to another location, he/she should be directed to contact the Risk Management department by 8:00 AM the following day for further instructions. If the employee will remain at the site where he/she was injured, he/she should complete the information on page 5 and sign the form. The Superintendent or Safety Coordinator will give the employee a copy of the signed document and forward the original to the Risk Management department.



J. J. White, Incorporated
Rules for Employees Injured On-the-Job

If you are injured while working for J. J. White, Incorporated, you must do the following:

- 1) In order to ensure that you receive the appropriate medical treatment for your injury, you must report the incident **IMMEDIATELY** to your Foreman and/or Superintendent; if your injury is serious and you require emergency treatment, they will arrange transportation for you to the appropriate acute care provider. If your injury does not require emergency treatment, proceed to step 2.
- 2) Complete and sign the J. J. White Incorporated Medical Consent Form and the J. J. White Incorporated Employee Notification & Acknowledgement Form (PA only) and the J. J. White Incorporated Injured Employee Accident Report and return these to your Foreman or Superintendent, along with a copy of some form of photo identification (e.g. driver's license); once these forms are completed, your Foreman/Superintendent will call the J. J. White Incorporated Risk Management Department, which will schedule an appointment (where necessary) with the appropriate physician and notify your Foreman/Superintendent of the date and time of that appointment.
- 3) After the doctor has completed your initial evaluation and treatment, if you have been cleared to return to full-duty work and your normal shift has not ended, return to the job and report to your foreman or superintendent, providing them with a copy of the medical report from the physician; if your shift has ended, call your foreman or superintendent and let them know you will be returning to work the next day. If you have not been cleared to return to full-duty work, you must: 1) contact your foreman or superintendent and tell them the physical restrictions the doctor has given you, 2) read and sign a copy of the Work Rules for Temporary Modified Duty, and 3) contact the J. J. White, Incorporated Risk Management Department at (215) 722-1000 and provide the same information; you will then be advised as to where and when to report for your next shift.
- 4) If your injury requires additional doctor visits and/or treatments which will be scheduled during your normal working hours, you must notify your foreman or superintendent at least 24 hours prior to the scheduled appointment and, after each appointment, provide a written notice from the doctor as to the time in and time out of your appointment.
- 5) If your injury requires treatment which will disable you for any period of time (e.g. surgery), you must contact the J. J. White, Incorporated Risk Management Department at (215) 722-1000 prior to the disabling treatment at least weekly thereafter (unless advised otherwise by the J. J. White Incorporated Risk Manager) until you are medically cleared by your physician to return to full-duty work.
- 6) If, at any time, you are dissatisfied with the treatment provided by your medical provider, you must contact the J. J. White, Incorporated Risk Management Department at (215) 722-1000 to discuss alternative providers.

I hereby acknowledge that I have been informed of, and understand, the above rules.

J. J. White, Incorporated Employee's Signature

Date



**J. J. White, Incorporated
Medical Consent Form**

I hereby authorize J. J. White, Incorporated and/or their Workers' Compensation insurer to inspect and make copies, including photostatic copies, of all hospital and medical records pertaining to the care and treatment rendered to me, solely for the purpose of administering my claim for workers' compensation benefits. The Genetic Information Nondiscrimination Act of 2008 (GINA) prohibits employers and other entities covered by GINA Title II from requesting or requiring genetic information of an individual or family member of the individual, except as specifically allowed by this law. To comply with this law, we are asking that you do not provide any genetic information when responding to this request for medical information. "Genetic information," as defined by GINA, includes an individual's family medical history, the results of an individual's or family member's genetic tests, the fact that an individual or an individual's family member sought or received genetic services, and genetic information of a fetus carried by an individual or an individual's family member or an embryo lawfully held by an individual or family member receiving assistive reproductive services.

J. J. White, Incorporated Employee Name (Please Print)

Date

J. J. White, Incorporated Employee Signature

Social Security Number



**J. J. White, Incorporated
Injured Employee Accident Report**

PERSONAL INFORMATION

| | |
|-----------------------------|---------------------------------|
| NAME: | DATE OF BIRTH: |
| SOCIAL SECURITY NO.: | DATE OF ACCIDENT: |
| HOME ADDRESS: | TIME OF ACCIDENT: |
| | FOREMEN: |
| | SUPERINTENDENT: |
| PHONE NUMBER: | DATE OF HIRE: |
| CRAFT/UNION: | SCHEDULED WORKING HOURS: |

JOB INFORMATION

| |
|---|
| J.J. WHITE, INC. JOB NUMBER: |
| NAME OF FACILITY OR PLANT WHERE J.J. WHITE JOB SITE IS LOCATED: |
| SPECIFIC LOCATION ON JOB SITE WHERE ACCIDENT OCCURRED: |
| SPECIFIC TASK YOU WERE ASSIGNED TO PERFORM BY FOREMAN/SUPERINTENDENT WHEN ACCIDENT OCCURRED: |
| SPECIFIC EQUIPMENT YOU WERE WORKING WITH AT THE TIME OF THE ACCIDENT: |
| ALL SAFETY EQUIPMENT YOU WERE WEARING/UTILIZING AT THE TIME OF THE ACCIDENT: |

Rev. 1/07



**J. J. White, Incorporated
Injured Employee Accident Report**

IDENTIFY OTHER PARTIES INVOLVED IN THIS ACCIDENT OR WHO WERE WORKING IN THE IMMEDIATE AREA AND WHAT THEY WERE DOING:

ACCIDENT INFORMATION

DESCRIBE THE ACCIDENT:

DESCRIBE WHAT YOU BELIEVE WERE THE CAUSES OF THE ACCIDENT:

DESCRIBE YOUR INJURIES:

LIST ANY OTHER FACTS YOU FEEL ARE RELATED TO THIS ACCIDENT:

INJURED EMPLOYEE'S SIGNATURE:

DATE:

SUPERINTENDENT'S SIGNATURE:

DATE:



**J. J. White, Incorporated
Workers' Compensation Authorization Form**

The below named individual is an employee of J. J. White, Incorporated who was involved in an apparent work-related accident on _____. In order to have all bills related to the treatment for this incident considered for payment in a timely fashion, please forward a UB-92 (or other appropriate claim form) along with applicable treatment notes to the following:

**J.J. White, Incorporated
5500 Bingham St.
Philadelphia, PA 19120
ATTN: Bill Nolan
Director of Risk Management**

J. J. White, Incorporated Employee Name (Please Print)

Date

Claim Number

Social Security Number

(This section to be completed by Medical Provider)

In the event of any questions or issues, please complete the following and fax to (215) 745-8076 or call the J. J. White, Inc. Risk Management department at (215) 722-1000.

Name of Treating Facility

Billing Department Contact and Phone Number



APPENDIX 3

ATTACHMENT “B”

Injury Kit NJ, DE, OH



J. J. White, Incorporated
Instructions for Completion of the Injury Kit

- 1) Prompt and proper treatment of the employee's injury is always our first concern – this paperwork comes second. However, if the injuries require treatment at a medical facility other than our normal occupational health facility, the Safety Coordinator or Superintendent reporting the claim should complete the Workers' Compensation Authorization Form and give it to the person accompanying the injured employee and instruct them to give it to the front desk at the emergency room or the doctor's office. This is an attempt to avoid having the injured employee's credit negatively affected when the medical provider fails to bill us for the services rendered.
- 2) If the injury does not require emergency treatment, have the employee read and complete the forms in the following order: 1) Rules for Employees Injured On-the-Job, 2) Injured Employee Accident Report, 3) Medical Consent Form and 4) Employee Notification & Acknowledgement Form (Pennsylvania only). If the incident occurs in Pennsylvania, you must give the injured employee a copy of the Panel Physical List that is posted for your location.
- 3) **If an injured employee declines medical treatment at this time, he/she MUST still complete the Rules for Employees Injured On-the-Job and the Injured Employee Accident Report. There will be no exceptions.**
- 4) If the employee **will not be** going to one of our normal occupational health clinics (i.e. Christiana, Riverfront, Park Care or WORKNET), the Safety Coordinator or Superintendent should complete the Workers' Compensation Authorization Form and give it to the employee to give to the appropriate person at the doctor's office.
- 5) After the employee has completed the necessary forms, be sure that they understand everything and make sure that they have signed and dated each of the forms. Give the injured employee a copy of the Rules for Employees Injured On-the-Job and the Employee Notification & Acknowledgement Form (Pennsylvania only). Send the completed forms (including a copy of the employee's photo ID) to Robert Celestino, Director of Risk Management at 5500 Bingham St., Philadelphia, PA 19120 as soon as possible.
- 6) Once the employee returns, send an e-mail to Bill Nolan (wnolan@jjwhiteinc.com) with the completed Workers' Compensation Initial Treatment Results form attached. If you do not have access to e-mail, fax the form to (215) 745-8076. If the employee will be on Modified Duty for longer than 2 weeks, or if he/she may be temporarily re-assigned to another location due to the physical work restrictions, the Superintendent or Safety Coordinator will give the employee a blank copy of the Work Rules for All Union Employees on Temporary Modified Duty and tell him/her to read the rules carefully. If the employee will be temporarily re-assigned to another location, he/she should be directed to contact the Risk Management department by 8:00 AM the following day for further instructions. If the employee will remain at the site where he/she was injured, he/she should complete the information on page 5 and sign the form. The Superintendent or Safety Coordinator will give the employee a copy of the signed document and forward the original to the Risk Management department.



J. J. White, Incorporated
Rules for Employees Injured On-the-Job

If you are injured while working for J. J. White, Incorporated, you must do the following:

- 1) In order to ensure that you receive the appropriate medical treatment for your injury, you must report the incident **IMMEDIATELY** to your Foreman and/or Superintendent; if your injury is serious and you require emergency treatment, they will arrange transportation for you to the appropriate acute care provider. If your injury does not require emergency treatment, proceed to step 2.
- 2) Complete and sign the J. J. White Incorporated Medical Consent Form and the J. J. White Incorporated Employee Notification & Acknowledgement Form (PA only) and the J. J. White Incorporated Injured Employee Accident Report and return these to your Foreman or Superintendent, along with a copy of some form of photo identification (e.g. driver's license); once these forms are completed, your Foreman/Superintendent will call the J. J. White Incorporated Risk Management Department, which will schedule an appointment (where necessary) with the appropriate physician and notify your Foreman/Superintendent of the date and time of that appointment.
- 3) After the doctor has completed your initial evaluation and treatment, if you have been cleared to return to full-duty work and your normal shift has not ended, return to the job and report to your foreman or superintendent, providing them with a copy of the medical report from the physician; if your shift has ended, call your foreman or superintendent and let them know you will be returning to work the next day. If you have not been cleared to return to full-duty work, you must: 1) contact your foreman or superintendent and tell them the physical restrictions the doctor has given you, 2) read and sign a copy of the Work Rules for Temporary Modified Duty, and 3) contact the J. J. White, Incorporated Risk Management Department at (215) 722-1000 and provide the same information; you will then be advised as to where and when to report for your next shift.
- 4) If your injury requires additional doctor visits and/or treatments which will be scheduled during your normal working hours, you must notify your foreman or superintendent at least 24 hours prior to the scheduled appointment and, after each appointment, provide a written notice from the doctor as to the time in and time out of your appointment.
- 5) If your injury requires treatment which will disable you for any period of time (e.g. surgery), you must contact the J. J. White, Incorporated Risk Management Department at (215) 722-1000 prior to the disabling treatment at least weekly thereafter (unless advised otherwise by the J. J. White Incorporated Risk Manager) until you are medically cleared by your physician to return to full-duty work.
- 6) If, at any time, you are dissatisfied with the treatment provided by your medical provider, you must contact the J. J. White, Incorporated Risk Management Department at (215) 722-1000 to discuss alternative providers.

I hereby acknowledge that I have been informed of, and understand, the above rules.

J. J. White, Incorporated Employee's Signature

Date



J. J. White, Incorporated
Employee Notification & Acknowledgement Form
And Workers' Compensation Information

Workers' Compensation is designed to provide wage loss benefits and reimbursement for reasonable and necessary medical expenses for one who is injured on the job. Your Employer shall provide payment for reasonable surgical and medical services, services rendered by physicians or other health care providers, medicines and supplies as needed. However, these payments could be delayed, or even denied, if you do not notify us immediately of your injury or illness. If your claim is denied, you have the right to request a hearing before a workers' compensation judge.

Additional general information (not including legal advice) can be obtained by contacting the Bureau of Workers' Compensation: 1) by mail at 1171 South Cameron Street, Room 103, Harrisburg, PA 17104-2501; 2) by phone at (800) 482-2383 (within PA) or (717) 772-4447 (outside PA) or (800) 362-4228 (for hearing & speech impaired individuals); or 3) via the internet at www.state.pa.us, PA Keyword: workers comp.

Your employer, in compliance with the Pennsylvania Workers' Compensation Act, as amended, has posted a list of at least (6) health care providers from which you are to select. This list is posted at various sites on the premises. You are required to visit one of the physicians or other health care providers so designated and shall continue to visit the same or another designated physician or health care provider for a period of ninety (90) days from the date of the first visit. Before seeking any treatment, be sure to check with the most current posted list of employer- designated health care providers. In addition, the following rights and duties under the Act are applicable:

1. The employee has the duty to obtain treatment for work-related injuries and illnesses from one or more of the designated health care providers for ninety (90) days from the date of the first visit to a designated provider.
2. The employee has the right to have all reasonable medical supplies and treatment related to the injury paid for by the employer as long as the treatment is obtained from a designated provider during the ninety (90) day period.
3. The employee has the right, during this ninety (90) day period, to switch from one health care provider to another provider on the list and that all of the treatment shall be paid for by the employer.
4. The employee has the right to seek treatment from a referral provider if the employee is referred to him by a designated provider, and the employer shall pay for the treatment rendered by the referral provider.
5. The employee has the right to seek emergency medical treatment from any provider but that subsequent non-emergency treatment shall be by a designated provider for the remainder of the ninety (90) day period.

6. The employee has the right to seek treatment, or medical consultation, from a non-designated provider during the ninety (90) day period, but that these services shall be at the employee's expense for the applicable ninety days. However, should invasive surgery be necessary for an employee be prescribed by a physician or other health care provider so designated by the employer, the employee shall be permitted to receive a second opinion from any health care provider of the employee's choosing. If the second opinion differs from the one provided by the physician or health care provider so designated by the employer, the employee shall determine which course of treatment is to be followed, provided that the second opinion includes a specific and detailed course of treatment. If the employee chooses to follow the procedures designated in the second opinion, such procedures shall be performed by one of the physicians or other health care providers so designated by the employer for a period of ninety (90) days from the date of the visit to the physician or other health care provider of the employee's own choice.
7. The employee has the right to seek treatment from any health care provider after the ninety (90) day period has ended and that treatment shall be paid for by the employer if it is reasonable and necessary.
8. After ninety (90) days from the date of the first treatment, the employee shall have the duty to notify the employer of treatment by a non-designated provider within (5) days of the first visit to that provider. The employer shall not be required to pay for treatment rendered by a non-designated provider prior to receiving this notification, if such services are determined, through utilization review, to have been unreasonable or unnecessary.
9. Also, please remember that prescription drugs and professional pharmaceutical services will only be reimbursed up to 100% of the average wholesale price of the product or service. Therefore, if you will be presenting a bill for payment or reimbursement of prescription drug or pharmaceutical services, please make sure that the pharmacy has charged you the proper amount as permitted under the Pennsylvania Workers' Compensation Act.

Your Signature on this form indicates that you have read the above and that you understand your rights and duties under the above provisions of the Pennsylvania Workers' Compensation Act.

I hereby acknowledge that I have been informed of, and understand, my rights and duties under the above provisions of the Pennsylvania Workers' Compensation Act, as amended and I have been provided a copy of the Panel Physician list for this worksite.

J. J. White, Incorporated Employee's Signature

Date

Print Name of J. J. White, Incorporated Employee



**J. J. White, Incorporated
Medical Consent Form**

I hereby authorize J. J. White, Incorporated and/or their Workers' Compensation insurer to inspect and make copies, including photostatic copies, of all hospital and medical records pertaining to the care and treatment rendered to me, solely for the purpose of administering my claim for workers' compensation benefits. The Genetic Information Nondiscrimination Act of 2008 (GINA) prohibits employers and other entities covered by GINA Title II from requesting or requiring genetic information of an individual or family member of the individual, except as specifically allowed by this law. To comply with this law, we are asking that you do not provide any genetic information when responding to this request for medical information. "Genetic information," as defined by GINA, includes an individual's family medical history, the results of an individual's or family member's genetic tests, the fact that an individual or an individual's family member sought or received genetic services, and genetic information of a fetus carried by an individual or an individual's family member or an embryo lawfully held by an individual or family member receiving assistive reproductive services.

J. J. White, Incorporated Employee Name (Please Print)

Date

J. J. White, Incorporated Employee Signature

Social Security Number



**J. J. White, Incorporated
Injured Employee Accident Report**

PERSONAL INFORMATION

| | |
|-----------------------------|---------------------------------|
| NAME: | DATE OF BIRTH: |
| SOCIAL SECURITY NO.: | DATE OF ACCIDENT: |
| HOME ADDRESS: | TIME OF ACCIDENT: |
| | FOREMEN: |
| | SUPERINTENDENT: |
| PHONE NUMBER: | DATE OF HIRE: |
| CRAFT/UNION: | SCHEDULED WORKING HOURS: |

JOB INFORMATION

| |
|---|
| J.J. WHITE, INC. JOB NUMBER: |
| NAME OF FACILITY OR PLANT WHERE J.J. WHITE JOB SITE IS LOCATED: |
| SPECIFIC LOCATION ON JOB SITE WHERE ACCIDENT OCCURRED: |
| SPECIFIC TASK YOU WERE ASSIGNED TO PERFORM BY FOREMAN/SUPERINTENDENT WHEN ACCIDENT OCCURRED: |
| SPECIFIC EQUIPMENT YOU WERE WORKING WITH AT THE TIME OF THE ACCIDENT: |
| ALL SAFETY EQUIPMENT YOU WERE WEARING/UTILIZING AT THE TIME OF THE ACCIDENT: |



**J. J. White, Incorporated
Injured Employee Accident Report**

IDENTIFY OTHER PARTIES INVOLVED IN THIS ACCIDENT OR WHO WERE WORKING IN THE IMMEDIATE AREA AND WHAT THEY WERE DOING:

ACCIDENT INFORMATION

DESCRIBE THE ACCIDENT:

DESCRIBE WHAT YOU BELIEVE WERE THE CAUSES OF THE ACCIDENT:

DESCRIBE YOUR INJURIES:

LIST ANY OTHER FACTS YOU FEEL ARE RELATED TO THIS ACCIDENT:

INJURED EMPLOYEE'S SIGNATURE:

DATE:

SUPERINTENDENT'S SIGNATURE:

DATE:



**J. J. White, Incorporated
Workers' Compensation Authorization Form**

The below named individual is an employee of J. J. White, Incorporated who was involved in an apparent work-related accident on _____. In order to have all bills related to the treatment for this incident considered for payment in a timely fashion, please forward a UB-92 (or other appropriate claim form) along with applicable treatment notes to the following:

**J.J. White, Incorporated
5500 Bingham St.
Philadelphia, PA 19120
ATTN: Bill Nolan
Director of Risk Management**

J. J. White, Incorporated Employee Name (Please Print)

Date

Claim Number

Social Security Number

(This section to be completed by Medical Provider)

In the event of any questions or issues, please complete the following and fax to (215) 745-8076 or call the J. J. White, Inc. Risk Management department at (215) 722-1000.

Name of Treating Facility

Billing Department Contact and Phone Number



APPENDIX 3

ATTACHMENT "C"

Auto Accident Reporting Forms

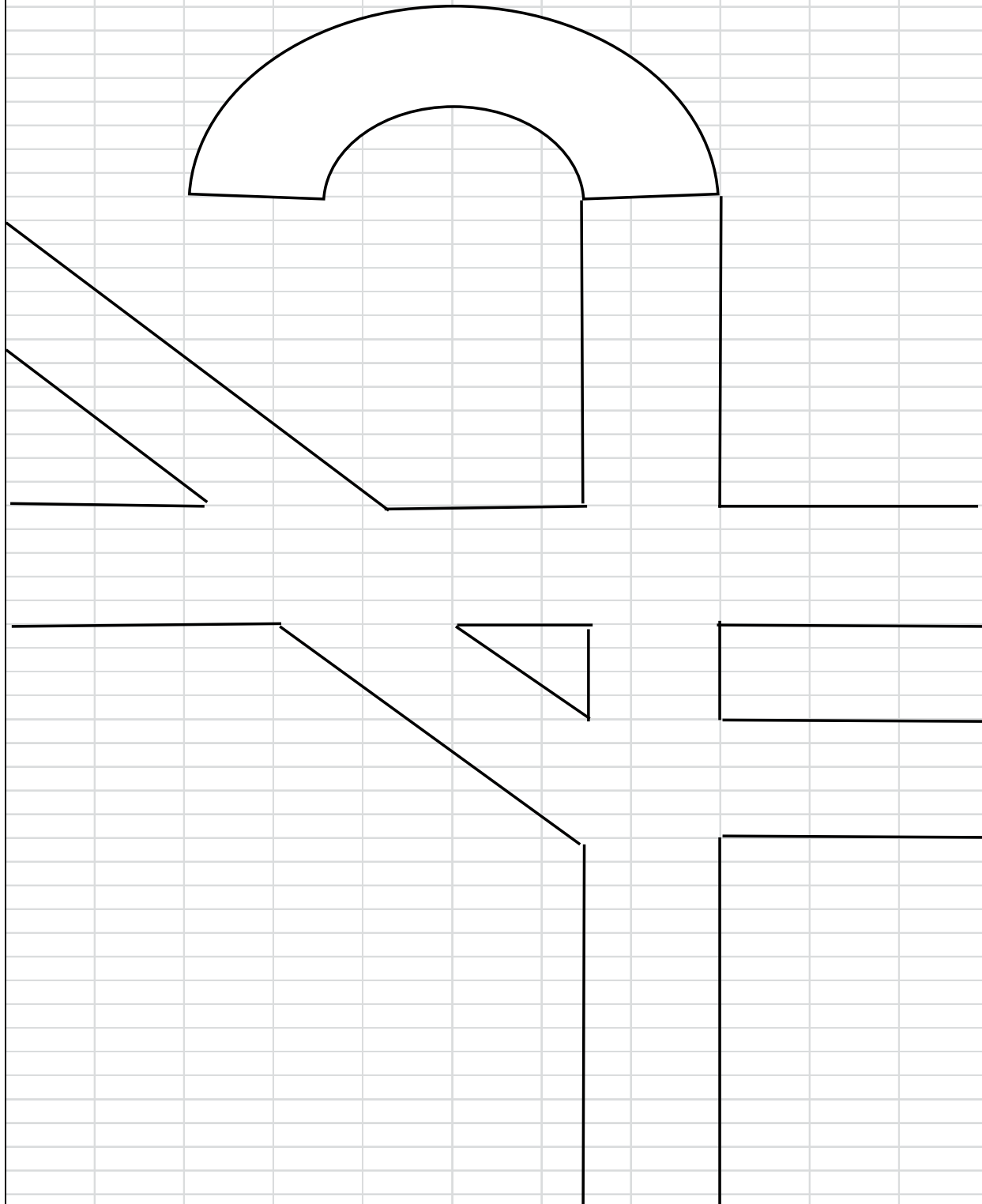
| | | | | | |
|---|--------------------|--|--|-------------------------------|-----------------|
| AUTO ACCIDENT REPORT -- COMPANY NAME: | | J. J. White, Incorporated 5500 Bingham Street, Philadelphia, PA 19120 | | | |
| Report Completed by: Bill Nolan | | Date of Report | | | |
| JJW Claim # | | Location Code | | Insurer | Travelers |
| JOB NUMBER | | Policy No. | | | |
| FOREMAN NAME / PHONE | | | | | |
| SUPERINTENDENT NAME / PHONE | | | | | |
| PM NAME / PHONE (215) 722-1000 | | | | | |
| COMPANY DRIVER, VEHICLE, and PASSENGER INFORMATION | | | | | |
| DATE | DAY | TIME | OUR DRIVER | | DATE of BIRTH |
| JOB TITLE | | DATE of HIRE | EMPLOYEE NUMBER | PHONE NUMBER | |
| HOME ADDRESS | | | | DRIVER LICENSE NUMBER & STATE | |
| VEHICLE ID NUMBER | TAG NUMBER & STATE | YEAR | MAKE | MODEL | |
| TRAILER ID NUMBER | TAG NUMBER & STATE | YEAR | MAKE | MODEL | |
| DIRECTION of TRAVEL | SPEED | WEATHER & ROAD CONDITION: Clear, Cloudy, Rain, Snow/Ice, Fog; Dry, Wet, Icy; Paved, Gravel | | | |
| ACCIDENT LOCATION (be specific) | | | | | CITATION ISSUED |
| VEHICLE BODY PART(s) INVOLVED | | | TYPE of DAMAGE to OUR VEHICLE | | TOWED |
| COMPANY VEHICLE OCCUPANTS | | | ----- | | |
| OCCUPANTS TAKEN to HOSPITAL | | | ----- | | |
| OTHER DRIVER, VEHICLE, PASSENGER and /or PROPERTY DAMAGE INFORMATION | | | | | |
| NAME of DRIVER | | ADDRESS | | DRIVER LICENSE NUMBER & STATE | |
| NAME of OWNER | | ADDRESS | | TAG NUMBER & STATE | |
| YEAR | MAKE | MODEL | DIRECTION of TRAVEL | SPEED | PHONE NUMBER |
| INSURANCE CARRIER | | POLICY NUMBER | | CITATION ISSUED | |
| INSURANCE AGENT | | ADDRESS | | PHONE NUMBER | |
| VEHICLE BODY PART(s) INVOLVED | | TYPE of DAMAGE to OTHER VEHICLE or PROPERTY | | TOWED | |
| OTHER VEHICLE OCCUPANTS | | ADDRESS | | PHONE NUMBER | |
| ----- | | ----- | | ----- | |
| OCCUPANTS TAKEN to HOSPITAL | | ----- | | ----- | |
| ACCIDENT DESCRIPTION: (give as much information as possible) | | | WERE PICTURES TAKEN? <input type="checkbox"/> Yes <input type="checkbox"/> | | |
| | | | | | |
| <i>Draw diagram on separate sheet of paper of accident scene.</i> | | | | | |
| WITNESSES | | | | | |
| NAME | | ADDRESS | | PHONE NUMBER | |
| ----- | | ----- | | ----- | |
| | | | | | |
| | | Police Department | | Form: A2 | |

Driver's Diagram of Accident: at:

JJW Claim No. _____

Driver Name _____

Accident Date _____

| | | |
|---|------------------------------------|-------------------------------|
|  | | |
| | | |
| Write in Street Names | Indicate which direction is North. | Indicate direction of travel. |
| Other Vehicle with the # 2 | | Form: A2 |

| | | | | | |
|--|--|---|--|--|-----------------|
| AUTO ACCIDENT REPORT - - COMPANY NAME: J. J. White, Inc. | | | | | |
| Report Completed by: | | Mr. Someone | | Date of Report | |
| November 10, 2019 | | | | | |
| Office Use > > Claim # | | 2020-001-XX | | Location Code | |
| 44987 | | ACIG / In-House | | ACIG | |
| JOB NUMBER | | 8000 | | OUR CUSTOMER | |
| Los Angeles Department of Water & Power | | | | | |
| FOREMAN NAME / PHONE | | n/a | | | |
| SUPERINTENDENT NAME / PHONE | | Mr. Smith (215) 722-1000 | | | |
| PM NAME / PHONE | | Mr. Jones (215) 722-1000 | | | |
| COMPANY DRIVER, VEHICLE, and PASSENGER INFORMATION | | | | | |
| DATE | | DAY | | TIME | |
| November 10, 2006 | | Wednesday | | 12:22 PM | |
| OUR DRIVER | | DATE of BIRTH | | | |
| Charlie Bochigalupe | | September 10, 1955 | | | |
| JOB TITLE | | DATE of HIRE | | EMPLOYEE NUMBER | |
| Superintendent | | November 9, 2006 | | 55555 | |
| PHONE NUMBER | | 760.555.6200 (cell); 760.555.2260 (office) | | | |
| HOME ADDRESS | | | | DRIVER LICENSE NUMBER & STATE | |
| 2290 Foothill Rd, Philadelphia, PA 19120 | | | | P98765432123456789; CA | |
| VEHICLE ID NUMBER | | TAG NUMBER & STATE | | YEAR | |
| B5439D | | WWW-99999; PA | | 2002 | |
| MAKE | | MODEL | | | |
| Chevrolet | | Silverado 1500 | | | |
| TRAILER ID NUMBER | | TAG NUMBER & STATE | | YEAR | |
| R9009 | | WWW-8888; CA | | 1976 | |
| MAKE | | MODEL | | | |
| Eager Beaver | | 10 Ton Equipment | | | |
| DIRECTION of TRAVEL | | SPEED | | WEATHER & ROAD CONDITION: Clear, Cloudy, Rain, Snow/Ice, Fog; Dry, Wet, Icy; Paved, Gravel | |
| North | | 45 | | Rain, Wet, Paved | |
| ACCIDENT LOCATION (be specific) | | | | | CITATION ISSUED |
| Intersection of Oxnard & Tajunga; North Hollywood, CA | | | | | Yes |
| VEHICLE BODY PART(s) INVOLVED | | | | TYPE of DAMAGE to OUR VEHICLE | |
| Front bumper, grill | | | | Bumper bent; grill cracked | |
| COMPANY VEHICLE OCCUPANTS | | | | Joe Franks | |
| OCCUPANTS TAKEN to HOSPITAL | | | | none | |
| OTHER DRIVER, VEHICLE, PASSENGER and /or PROPERTY DAMAGE INFORMATION | | | | | |
| NAME of DRIVER | | ADDRESS | | DRIVER LICENSE NUMBER & STATE | |
| Edgar Buchanan | | 2788 W. Old Nashville Road; Stony Lonesome, IN 47201 | | 577588 5858 55543; IN | |
| NAME of OWNER | | ADDRESS | | TAG NUMBER & STATE | |
| (same as above) | | (same as above) | | TLC-9889; IN | |
| YEAR | | MAKE | | MODEL | |
| 1958 | | Ford | | Edsel | |
| DIRECTION of TRAVEL | | SPEED | | PHONE NUMBER | |
| North | | 0 | | 765.555.6767 | |
| INSURANCE CARRIER | | POLICY NUMBER | | CITATION ISSUED | |
| Liberty Mutual of Omaha | | IN 54900084-99 | | No | |
| INSURANCE AGENT | | ADDRESS | | PHONE NUMBER | |
| Jethro Bodine | | 2882 Brown Hill Road; Gnow Bone, IN 47448 | | 765.555.6453 | |
| VEHICLE BODY PART(s) INVOLVED | | TYPE of DAMAGE to OTHER VEHICLE or PROPERTY | | TOWED | |
| Rear bumper; trunk, lights | | Bumper fell off, trunk dented, light lens cover cracked | | No | |
| OTHER VEHICLE OCCUPANTS | | ADDRESS | | PHONE NUMBER | |
| Bea Benederet | | (same as driver) | | (same as driver) | |
| OCCUPANTS TAKEN to HOSPITAL | | Edgar Buchanan | | | |
| ACCIDENT DESCRIPTION: (give as much information as possible) | | | | | |
| WERE PICTURES TAKEN? Yes | | | | | |
| It was raining heavily. Car in front of me stopped suddenly when the light turned yellow on Smith Blvd. My truck slid on the wet pavement and struck the car in front of me. I was towing an empty equipment trailer that pushed my truck. | | | | | |
| Draw diagram on separate sheet of paper of accident scene. | | | | | |
| WITNESSES | | | | | |
| NAME | | ADDRESS | | PHONE NUMBER | |
| Ms. Sara Conner | | 22 Coldwater Canyon; Studio City, CA 91604 | | 760.555.8642 | |
| Yes | | Police Department | | Rancho Cucamonga Sheriff Station | |

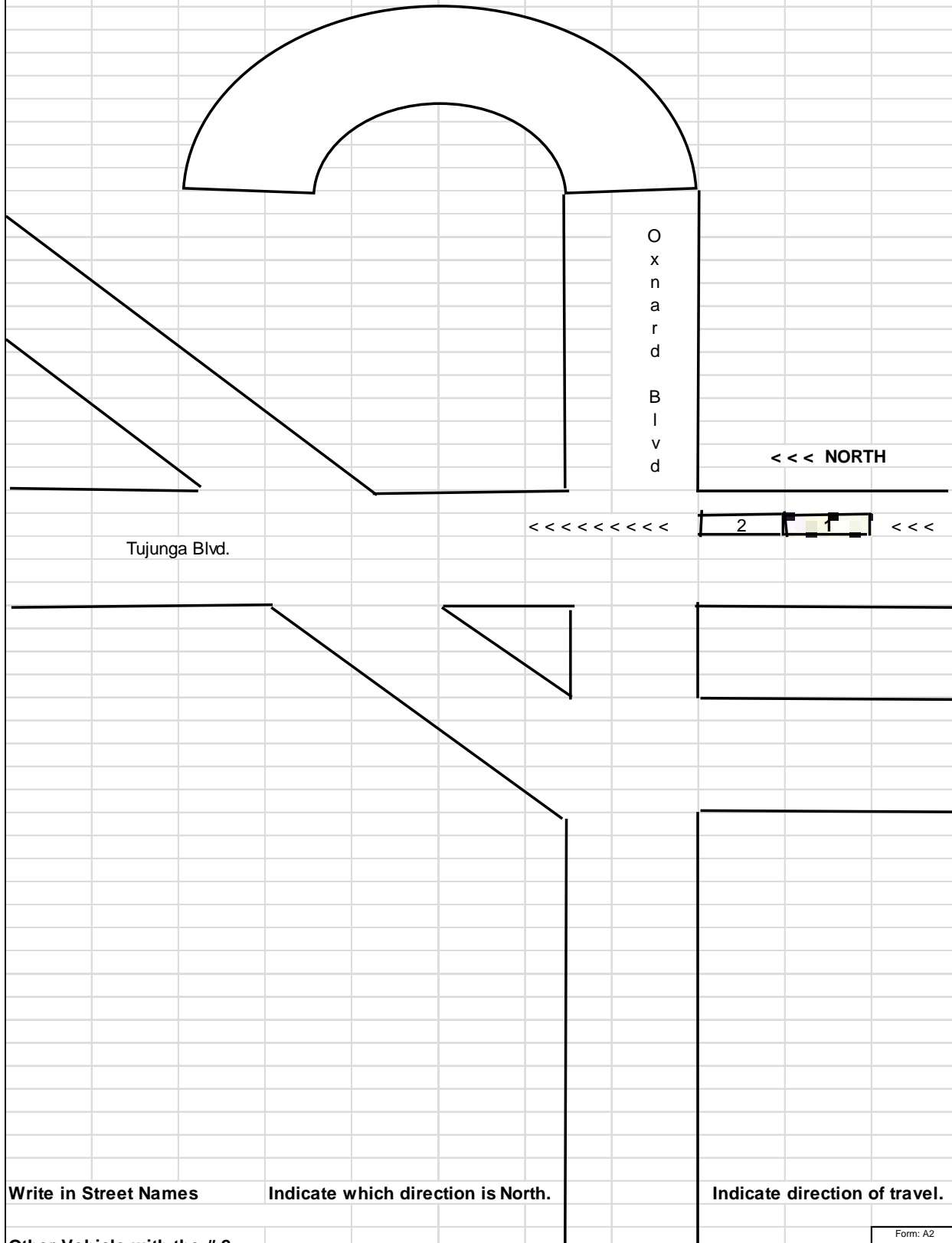
Driver's Diagram of Accident: at: Oxnard & Tajunga; North Hollywood, CA

Joe Franks

Driver Name

November 9, 2019

Accident Date



APPENDIX 4

BLOODBORNE PATHOGENS EXPOSURE CONTROL PLAN



J. J. WHITE, INC. BLOODBORNE PATHOGEN EXPOSURE PLAN

JJ White Incorporated is committed to providing a safe and healthful work environment for our entire staff. In pursuit of this goal, the following exposure control plan (ECP) is provided to eliminate or minimize occupational exposure to bloodborne pathogens in accordance with OSHA standard 29 *CFR* 1910.1030, "Occupational Exposure to Bloodborne Pathogens."

The ECP is a key document to assist our organization in implementing and ensuring compliance with the standard, thereby protecting our employees. This ECP includes:

- Determination of employee exposure
- Implementation of various methods of exposure control, including:
 - Universal precautions
 - Engineering and work practice controls
 - Personal protective equipment
 - Housekeeping
- Hepatitis B, Tetanus and Diphtheria Vaccinations
- Post-exposure evaluation and follow-up
- Communication of hazards to employees and training
- Recordkeeping
- Procedures for evaluating circumstances surrounding exposure incidents

Implementation methods for these elements of the standard are discussed in the subsequent pages of this ECP.

PROGRAM ADMINISTRATION

- The Safety Department is responsible for implementation of the ECP. Corporate Safety Director will maintain, review, and update the ECP at least annually, and whenever necessary to include new or modified tasks and procedures. Contact location/phone number: Safety Department at 215-722-1000.
- Those employees who are determined to have occupational exposure to blood or other potentially infectious materials (OPIM) must comply with the procedures and work practices outlined in this ECP.
- The Tool & Equipment Manager will provide and maintain all necessary personal protective equipment (PPE), engineering controls, labels, and red bags as required by the standard. The tool & Equipment Manager will ensure that adequate supplies of the aforementioned equipment are available in the appropriate sizes. Contact location/phone number: Safety Department at 215-722-1000.



J. J. WHITE, INC. BLOODBORNE PATHOGEN EXPOSURE PLAN

- The Safety Department will be responsible for ensuring that all medical actions required by the standard are performed and that appropriate employee health and OSHA records are maintained. Contact location/phone number: Safety Department at 215-722-1000.
- The Safety Department will be responsible for training, documentation of training, and making the written ECP available to employees, OSHA, and NIOSH representatives. Contact location/phone number: Safety Department at 215-722-1000.

EMPLOYEE EXPOSURE DETERMINATION

The following is a list of job classifications in which some employees at our establishment have occupational exposure. Included is a list of tasks and procedures, or groups of closely related tasks and procedures, in which occupational exposure may occur for these individuals:

Boilermaker NTL's/ General Work Activity within a WWTP
All personnel certified to administer First Aid/CPR
All personnel working in a Medical Facility

METHODS OF IMPLEMENTATION AND CONTROL

Universal Precautions All employees will utilize universal precautions.

Exposure Control Plan

Employees covered by the bloodborne pathogens standard receive an explanation of this ECP during their initial training session. It will also be reviewed in their annual refresher training. All employees can review this plan at any time during their work shifts by contacting the Safety Department at 215-722-1000. If requested, we will provide an employee with a copy of the ECP free of charge and within 15 days of the request.

The Corporate Safety Director is responsible for reviewing and updating the ECP annually or more frequently if necessary to reflect any new or modified tasks and procedures that affect occupational exposure and to reflect new or revised employee positions with occupational exposure.

Engineering Controls and Work Practices

Engineering controls and work practice controls will be used to prevent or minimize exposure to bloodborne pathogens. The specific engineering controls and work practice controls used are listed below:

Engineering

- Biohazard bags and biohazard disposal container.
- Personal Protective Equipment – Gloves, Goggles, Face shield, CPR Barrier Mask

Revised 02/01/2024



J. J. WHITE, INC. BLOODBORNE PATHOGEN EXPOSURE PLAN

Work Practices

- Remove/dispose of soiled protective clothing as soon as possible.
- Clean and disinfect all possibly contaminate equipment and work surfaces.
- Wash hands immediately after providing care.
- Do not eat, drink, smoke, apply cosmetics, or lip balm, handle contact lenses or touch your mouth, nose or eyes when exposure to infectious materials is possible.
- Use alcohol based hand rubs where hand washing facilities are not available.
- Latex gloves are used during any first aid treatment.

This facility identifies the need for changes in engineering controls and work practices through review of OSHA records and employee discussions.

The Corporate Safety Director and Site Supervisor are responsible for ensuring that these recommendations are implemented.

Personal Protective Equipment (PPE)

PPE is provided to our employees at no cost to them. Training in the use of the appropriate PPE for specific tasks or procedures is provided by the Safety Department .The types of PPE available to employees are as follows:

Gloves

PPE is located in the Jobsite Trailer and may be obtained through the Superintendent. Employees who need PPE can make request through Superintendent. The Tool & Equipment Manager will ensure PPE is available.

All employees using PPE must observe the following precautions:

- Wash hands immediately or as soon as feasible after removing gloves or other PPE.
- Remove PPE after it becomes contaminated and before leaving the work area.
- Used PPE may be disposed of in the medical waste container in the Safety Trailer.
- Wear appropriate gloves when it is reasonably anticipated that there may be hand contact with blood or OPIM, and when handling or touching contaminated items or surfaces; replace gloves if torn, punctured or contaminated, or if their ability to function as a barrier is compromised.
- Utility gloves may be decontaminated for reuse if their integrity is not compromised; discard utility gloves if they show signs of cracking, peeling, tearing, puncturing, or deterioration.
- Never wash or decontaminate disposable gloves for reuse.
- Wear appropriate face and eye protection when splashes, sprays, spatters, or droplets of blood or OPIM pose a hazard to the eye, nose, or mouth.
- Remove immediately or as soon as feasible any garment contaminated by blood or OPIM, in such a way as to avoid contact with the outer surface.



J. J. WHITE, INC. BLOODBORNE PATHOGEN EXPOSURE PLAN

The procedure for handling used PPE is as follows:

Any contaminated PPE shall be placed in the Biohazard waste container in the safety trailer.

Housekeeping

Regulated waste is placed in containers which are closable, constructed to contain all contents and prevent leakage, appropriately labeled or color-coded (see the following section " Labels"), and closed prior to removal to prevent spillage or protrusion of contents during handling.

The procedure for handling other regulated waste is to contact the WWTP Contact for proper disposal.

Labels

The following labeling methods are used in this facility:

The Site Supervisor is responsible for ensuring that red Biohazard bags are used as required if regulated waste or contaminated equipment is brought into the facility. Employees are to notify the Corporate Safety Director or the Safety Department if they discover regulated waste containers, contaminated equipment, etc., without proper labels.

POST-EX POSU RE EVALU ATION AND FOLLOW-U P

Should an exposure incident occur, contact Corporate Safety Director . An immediately available confidential medical evaluation and follow-up will be conducted by MultiCare Occupation Medicine. Following initial first aid (clean the wound, flush eyes or other mucous membrane, etc.), the following activities will be performed:

- Document the routes of exposure and how the exposure occurred.
- Identify and document the source individual (unless the employer can establish that identification is infeasible or prohibited by state or local law).
- Obtain consent and make arrangements to have the source individual tested as soon as possible to determine HIV, HCV, and HBV infectivity; document that the source individual's test results were conveyed to the employee's health care provider.
- If the source individual is already known to be HIV, HCV and/or HBV positive, new testing need not be performed.
- Assure that the exposed employee is provided with the source individual's test results and with information about applicable disclosure laws and regulations concerning the identity and infectious status of the source individual (e.g., laws protecting confidentiality).
- After obtaining consent, collect exposed employee's blood as soon as feasible after exposure incident, and test blood for HBV and HIV serological status
- If the employee does not give consent for HIV serological testing during collection of blood for baseline testing, preserve the baseline blood sample for at least 90 days; if the exposed employee elects to have the baseline sample tested during this waiting period, perform testing as soon as feasible.



J. J. WHITE, INC. BLOODBORNE PATHOGEN EXPOSURE PLAN

ADMINISTRATION OF POST-EXPOSURE EVALUATION AND FOLLOW-UP

The Safety Department ensures that health care professional(s) responsible for employee's hepatitis B, tetanus and diphtheria vaccination and post-exposure evaluation and follow-up are given a copy of OSHA's bloodborne pathogens standard.

The Corporate Safety Director ensures that the health care professional evaluating an employee after an exposure incident receives the following:

- a description of the employee's job duties relevant to the exposure incident
- route(s) of exposure
- circumstances of exposure
- if possible, results of the source individual's blood test
- relevant employee medical records, including vaccination status

The Safety Department provides the employee with a copy of the evaluating health care professional's written opinion within 15 days after completion of the evaluation.

PROCEDURES FOR EVALUATING THE CIRCUMSTANCES SURROUNDING AN EXPOSURE INCIDENT

The Safety Department will review the circumstances of all exposure incidents to determine:

- engineering controls in use at the time
- work practices followed
- protective equipment or clothing that was used at the time of the exposure incident (gloves, eye shields, etc.)
- location of the incident
- procedure being performed when the incident occurred
- employee's training

If revisions to this ECP are necessary the Corporate Safety Director will ensure that appropriate changes are made.



J. J. WHITE, INC. BLOODBORNE PATHOGEN EXPOSURE PLAN

EMPLOYEE TRAINING

All employees who have occupational exposure to bloodborne pathogens receive initial and annual training conducted by the Safety Department. Training will be conducted by a Safety Department representative who has obtained American Red Cross First Aid and Bloodborne Pathogen Instructor Certification.

All employees who have occupational exposure to bloodborne pathogens receive training on the epidemiology, symptoms, and transmission of bloodborne pathogen diseases. In addition, the training program covers, at a minimum, the following elements:

- a copy and explanation of the OSHA bloodborne pathogen standard
- an explanation of our ECP and how to obtain a copy
- an explanation of methods to recognize tasks and other activities that may involve exposure to blood and OPIM, including what constitutes an exposure incident
- an explanation of the use and limitations of engineering controls, work practices, and PPE
- an explanation of the types, uses, location, removal, handling, decontamination, and disposal of PPE
- an explanation of the basis for PPE selection
- information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine will be offered free of charge
- information on the appropriate actions to take and persons to contact in an emergency involving blood or OPIM
- an explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available
- information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident
- an explanation of the signs and labels and/or color coding required by the standard and used at this facility
- an opportunity for interactive questions and answers with the person conducting the training session.

Training materials for this facility are available at the Safety Office.



J. J. WHITE, INC. BLOODBORNE PATHOGEN EXPOSURE PLAN

RECORDKEEPING

Training Records Training records are completed for each employee upon completion of training. These documents will be kept for at least three years at the Safety Office.

The training records include:

- the dates of the training sessions
- the contents or a summary of the training sessions
- the names and qualifications of persons conducting the training
- the names and job titles of all persons attending the training sessions

Employee training records are provided upon request to the employee or the employee's authorized representative within 15 working days. Such requests should be addressed to Safety Department.

Medical Records

Medical records are maintained for each employee with occupational exposure in accordance with 29 *CFR* 1910.1020, "Access to Employee Exposure and Medical Records."

Risk Management Department is responsible for maintenance of the required medical records. These confidential records are kept at JJ White Incorporated Main Office, 5500 Bingham Street, Philadelphia, PA 19120 for at least the duration of employment plus 30 years.

Employee medical records are provided upon request of the employee or to anyone having written consent of the employee within 15 working days. Such requests should be sent to Safety Department.

OSHA Recordkeeping

An exposure incident is evaluated to determine if the case meets OSHA's Recordkeeping Requirements (29 *CFR* 1904). This determination and the recording activities are done by the Director of Risk Management.

APPENDIX 5
CONSTRUCTION SAFETY INSPECTION
eTRACKER 5 AUDITS

eTracker 5 Audit Requirements

- Minimum 1/week per jobsite
- Scanned or sent to Kim Stauffer (kstauffer@jjwhiteinc.com) weekly.
- ETracker5 Group Reports will be distributed with meeting minutes from Corporate Safety Telcon.
- All un-satisfactory items need to be closed out monthly or sooner if possible.

Instructions

BUBBLES MUST BE COMPLETELY FILLED IN USE ● NOT ⊗

- Read all selections carefully!
- Answer either “S” satisfactory or “U” un-satisfactory
- If an item is un-satisfactory and needs further attention please expand on item by using the comment section at end of card. Make sure Supervision or Safety is made aware of outstanding item.
- If something is found to be un-satisfactory and can be easily remediated please mark it as U and state the remediation of the item in the comment section
- If something requires owner involvement, please document to whom the issue was addressed with and date of notifications.

What Happens Next on Unsatisfactory Items?

- All eTracker 5 cards that are submitted with an un-satisfactory finding will be brought up during the weekly operational call to see if the item has been corrected.
- If when an un-satisfactory item has been corrected after an eTracker card is scanned, notify Bill Nolan (wnolan@jjwhiteinc.com) with the resolution and the item will be closed out manually – you will not need to re-scan the eTracker 5 card with a completed date.

Inspection Date M M D D Y Y

Inspected By (First Name)

Inspected By (Last Name)

Job Number

Site Location

Trade(s)

Description of Work

use ☒ not ☒ not ☒ (S) Safe / (U) Unsafe

- A ADMINISTRATION CONTROLS S U**
- A.1 JSA submitted each trade ☐ ☐
- A.2 JSA Quality (Hazard ID & Control) ☐ ☐
- A.3 JSA Quality(Work Description/Loc.) ☐ ☐
- A.4 JSA (Focus on three) ☐ ☐
- A.5 JSA (Employee Sign-off) ☐ ☐
- A.6 JSA (Eye Wash/Shower Loc.) ☐ ☐
- A.7 JSA (Muster Point) ☐ ☐
- A.8 JSA Recertified ☐ ☐
- A.9 High Hazard JSA Completed where Applicable ☐ ☐
- A.10 High Hazard JSA Recertified if one was Applicable ☐ ☐
- A.11 JJW Foreman Certified/Trained ☐ ☐

- B MEDICAL/EMERGENCY S U**
- B.1 Automatic External Defib (AED) ☐ ☐
- B.2 First Aid Kit ☐ ☐
- B.3 First Aid / CPR available ☐ ☐
- B.4 Eyewash Station(s) ☐ ☐
- B.5 Emer Numbers Posted(Hosp etc) ☐ ☐
- B.6 Company Emer Contd Info ☐ ☐
- B.7 JJW Team contact numbers ☐ ☐
- B.8 Map to medical facility(s) ☐ ☐
- B.9 Emergency Action Plan ☐ ☐

- C HAZARD COMMUNICATIONS S U**
- C.1 Readily available ☐ ☐
- C.2 Inventory List (MSDS) ☐ ☐
- C.3 Proper labels on containers ☐ ☐
- C.4 Employees trained ☐ ☐

- D PERMITS S U**
- D.1 Hot Work ☐ ☐
- D.2 Cold Work ☐ ☐
- D.3 Fire Hydrant ☐ ☐

- E CRANES & HOISTING EQUIP. S U**
- E.1 Proper Distance power lines/de-ener ☐ ☐
- E.2 Crane supported and level ☐ ☐
- E.3 Outtrigger extend/mats in place ☐ ☐
- E.4 Anti two block device ☐ ☐
- E.5 Swing radius barricaded ☐ ☐
- E.6 Signal Person Identified & Trained ☐ ☐
- E.7 Hand or Radio Signals observed ☐ ☐
- E.8 Lift Horn used ☐ ☐
- E.9 Loads properly secured ☐ ☐
- E.10 Weight of load verified ☐ ☐
- E.11 Rigging rated for proper Capacity ☐ ☐
- E.12 Slings Condition (Worn/Frayed/Label) ☐ ☐
- E.13 Tag line(s) used ☐ ☐
- E.14 Hands clear of the load ☐ ☐
- E.15 Cert or verify training ☐ ☐
- E.16 Proper use of "CAZ" id ☐ ☐
- E.17 Rigging Inspected ☐ ☐
- E.18 Critical Lift Plan Completed if Applicable ☐ ☐

- F CONFINED SPACE S U**
- F.1 Is permit required? ☐ ☐
- F.2 "Confined space" sign at entry ☐ ☐
- F.3 "Standby" person at entry ☐ ☐
- F.4 Prop barricaded if not in use ☐ ☐
- F.5 Atmospheric conditions ☐ ☐
- F.6 Atmos monitor equip in place ☐ ☐
- F.7 Confined Space Training ☐ ☐
- F.8 Sign-in/out log at the entry ☐ ☐
- F.9 Sign-in/out log accurate ☐ ☐
- F.10 Rescue plan/emerg #s/map ☐ ☐

- G MANLIFTS, SCISSORS LIFTS, AERIAL LIFTS S U**
- G.1 Proper equipment for the job ☐ ☐
- G.2 Operating on flat surface. ☐ ☐
- G.3 Safe Dist. maintained (10' Min). ☐ ☐
- G.4 Harness worn by occupants ☐ ☐
- G.5 Tied to proper anch point ☐ ☐
- G.6 Gate or chain secured ☐ ☐
- G.7 Proper loading ☐ ☐
- G.8 Equip Oper Manual with Lift ☐ ☐
- G.9 Operator(s) training ☐ ☐
- G.10 AWP JSA ☐ ☐

- H SCAFFOLDS S U**
- H.1 Surface in safe condition ☐ ☐
- H.2 Wood/metal planks in safe con. ☐ ☐
- H.3 Sills, plates, jacks, installed, & sec ☐ ☐
- H.4 Guardrails in place @ 6' ☐ ☐
- H.5 Bracing and pins in place ☐ ☐
- H.6 Proper access to platforms ☐ ☐
- H.7 Overhead clear. on ladders (24") ☐ ☐
- H.8 Properly secured to structure ☐ ☐
- H.9 Proper loading of materials ☐ ☐
- H.10 Deck is free of trash & debris ☐ ☐
- H.11 Compatible components used ☐ ☐
- H.12 Safe work distances ☐ ☐
- H.13 Inspected daily ☐ ☐
- H.14 Competent person present ☐ ☐
- H.15 Confirm no conflicting work above/below ☐ ☐

- I LADDERS / STAIRS S U**
- I.1 Proper use of ladder ☐ ☐
- I.2 Straight Ladder tied off ☐ ☐
- I.3 Extension ladder 4:1 pitch ☐ ☐
- I.4 Ladder ext 3' above landing ☐ ☐
- I.5 Clear of debris/materials ☐ ☐
- I.6 Safe work dist from hazards ☐ ☐
- I.7 Properly guarded in roadways ☐ ☐
- I.8 Inspected for defects ☐ ☐
- I.9 Rails at stairs/landings ☐ ☐
- I.10 Slip trip exposure elim ☐ ☐
- I.11 Stairs illuminated ☐ ☐
- I.12 Access break >19" ☐ ☐

- LADDERS/STAIRS (Cont.) S U**
- L.13 Step ladders >6' tied off ☐ ☐
- L.14 Step ladders-Spreaders locked ☐ ☐
- L.15 EE uses 3 points of contact ☐ ☐

- J FALL PROTECTION S U**
- J.1 Fall protection at 6' ☐ ☐
- J.2 Anch Points Proper Capacity ☐ ☐
- J.3 Fall Prot effect-will Arrest fall ☐ ☐
- J.4 Body harness worn Properly ☐ ☐
- J.5 Equipment Inspected ☐ ☐
- J.6 Ext guardrail (roof/floor/edge) ☐ ☐
- J.7 Int guardrail (wall/floor open) ☐ ☐
- J.8 Stair/Ramp/walkway protected ☐ ☐
- J.9 Floor cover adeq/secure/label ☐ ☐
- J.10 Fall Protection Plan ☐ ☐

- K FIRE PROTECTION S U**
- K.1 Fire suppression equip avail ☐ ☐
- K.2 Fire Ext-Monthly & Annual insp ☐ ☐
- K.3 Prop signs in store areas ☐ ☐
- K.4 Emergency vehicle access ☐ ☐
- K.5 Air Monitor-Hot Work<10%LEL ☐ ☐
- K.6 Fire Watch in place when req ☐ ☐

- L WELDING/CUTTING S U**
- L.1 Gas cylinders stored properly ☐ ☐
- L.2 Gauges&Torch in good condition ☐ ☐
- L.3 Flash Arrest on Burn/Cut torch ☐ ☐
- L.4 Weld Screen (s)- Where Required ☐ ☐
- L.5 Comb/Flam're away from weld ops ☐ ☐
- L.6 Ankle strap/bib for pos weld ☐ ☐
- L.7 Leads in good condition ☐ ☐
- L.8 Gauges working properly ☐ ☐
- L.9 Welding Machine ventilated ☐ ☐
- L.10 Fire blanket in place when required ☐ ☐

- M ELECTRICAL S U**
- M.1 LO/TO procedures in place ☐ ☐
- M.2 GFCI's used ☐ ☐
- M.3 Branch Circuits Labeled ☐ ☐
- M.4 Electric Cord proper rating ☐ ☐
- M.5 Cords protected from traffic ☐ ☐
- M.6 Cords in good condition ☐ ☐
- M.7 Cords have twist-lock ☐ ☐
- M.8 Energized parts protected ☐ ☐
- M.9 Proper use temp power boxes ☐ ☐
- M.10 Explosion Proof Fixtures ☐ ☐
- M.11 Signage present-i.e. High Volt ☐ ☐
- M.12 Low Voltage Lighting ☐ ☐
- M.13 Hot Work Permit ☐ ☐

| N POWER TOOLS - AIR, ELECTRIC & POWDER ACTUATED | | | S | U |
|--|-----------------------------------|-----------------------|-----------------------|---|
| N.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> | |
| N.2 | Information label on tool | <input type="radio"/> | <input type="radio"/> | |
| N.3 | Guard(s) in place | <input type="radio"/> | <input type="radio"/> | |
| N.4 | Mfg. handles in place | <input type="radio"/> | <input type="radio"/> | |
| N.5 | Tool in good condition | <input type="radio"/> | <input type="radio"/> | |
| N.6 | Abrasv wheel in good condition | <input type="radio"/> | <input type="radio"/> | |
| N.7 | Bit/blade - sharp/ good condition | <input type="radio"/> | <input type="radio"/> | |
| N.8 | Elect cords& Equip- current insp | <input type="radio"/> | <input type="radio"/> | |
| N.9 | Tool Currently Inspected | <input type="radio"/> | <input type="radio"/> | |

| O HAND TOOLS | | | S | U |
|--------------|------------------------------------|-----------------------|-----------------------|---|
| O.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> | |
| O.2 | Handles (not damaged) | <input type="radio"/> | <input type="radio"/> | |
| O.3 | Jaws (not worn or damaged) | <input type="radio"/> | <input type="radio"/> | |
| O.4 | Knock Wrench-Best Tech Used | <input type="radio"/> | <input type="radio"/> | |
| O.5 | Handle/Strap extension used | <input type="radio"/> | <input type="radio"/> | |
| O.6 | Trailer properly hitched | <input type="radio"/> | <input type="radio"/> | |
| O.7 | Cargo properly secured bed/trailer | <input type="radio"/> | <input type="radio"/> | |

| P HOUSEKEEPING | | | S | U |
|----------------|-------------------------------------|-----------------------|-----------------------|---|
| P.1 | Clear access to site | <input type="radio"/> | <input type="radio"/> | |
| P.2 | Slip, Trip, Fall Hazards | <input type="radio"/> | <input type="radio"/> | |
| P.3 | Tools & Equip stored properly | <input type="radio"/> | <input type="radio"/> | |
| P.4 | Materials stored properly | <input type="radio"/> | <input type="radio"/> | |
| P.5 | Trash/Debris in prop container | <input type="radio"/> | <input type="radio"/> | |
| P.6 | Low clearance areas flag/identified | <input type="radio"/> | <input type="radio"/> | |
| P.7 | Impalement prot (rebar cap etc) | <input type="radio"/> | <input type="radio"/> | |
| P.8 | Roadway around proj clear | <input type="radio"/> | <input type="radio"/> | |
| P.9 | Designated Parking | <input type="radio"/> | <input type="radio"/> | |
| P.10 | Proper Signage | <input type="radio"/> | <input type="radio"/> | |

| Q P.P.E: PERSONAL PROTECTIVE EQUIPMENT | | | S | U |
|---|---------------------------------------|-----------------------|-----------------------|---|
| Q.1 | Hard hat | <input type="radio"/> | <input type="radio"/> | |
| Q.2 | Safety glasses | <input type="radio"/> | <input type="radio"/> | |
| Q.3 | Glasses / face shields | <input type="radio"/> | <input type="radio"/> | |
| Q.4 | Approp. Hearing | <input type="radio"/> | <input type="radio"/> | |
| Q.5 | Hi-visibility const best | <input type="radio"/> | <input type="radio"/> | |
| Q.6 | Gloves | <input type="radio"/> | <input type="radio"/> | |
| Q.7 | Work Boots | <input type="radio"/> | <input type="radio"/> | |
| Q.8 | Metatarsal protection | <input type="radio"/> | <input type="radio"/> | |
| Q.9 | PPE Stored properly | <input type="radio"/> | <input type="radio"/> | |
| Q.10 | Respirators proper for task | <input type="radio"/> | <input type="radio"/> | |
| Q.11 | Respirator cartridges proper for task | <input type="radio"/> | <input type="radio"/> | |
| Q.12 | Face Shield | <input type="radio"/> | <input type="radio"/> | |
| Q.13 | Fire Retardant Clothing | <input type="radio"/> | <input type="radio"/> | |
| Q.14 | SCBA | <input type="radio"/> | <input type="radio"/> | |

| R MOTORIZED EQUIPMENT | | | S | U |
|-----------------------|--|-----------------------|-----------------------|---|
| R.1 | Seat belts used | <input type="radio"/> | <input type="radio"/> | |
| R.2 | Operator Conducts 360 Check | <input type="radio"/> | <input type="radio"/> | |
| R.3 | Operator obeys Speed Limit | <input type="radio"/> | <input type="radio"/> | |
| R.4 | Operator Avoids Backing, when possible | <input type="radio"/> | <input type="radio"/> | |
| R.5 | Operator Backs First to Park,when possible | <input type="radio"/> | <input type="radio"/> | |
| R.6 | Back up alarm functioning | <input type="radio"/> | <input type="radio"/> | |
| R.7 | Light, Signals, Horn&Brakes functioning | <input type="radio"/> | <input type="radio"/> | |
| R.8 | Windshield free of obstructions | <input type="radio"/> | <input type="radio"/> | |
| R.9 | Flagman used if applicable | <input type="radio"/> | <input type="radio"/> | |
| R.10 | Air Comp clear-Exhaust Fume Exp | <input type="radio"/> | <input type="radio"/> | |
| R.11 | 3 Points of Contact used On/Off Vehicle | <input type="radio"/> | <input type="radio"/> | |
| R.12 | EE Reports Vehicle Deficiencies | <input type="radio"/> | <input type="radio"/> | |
| R.13 | Trailer properly hitched | <input type="radio"/> | <input type="radio"/> | |
| R.14 | Cargo properly secured bed/trailer | <input type="radio"/> | <input type="radio"/> | |

| S ENVIRONMENTAL | | | S | U |
|-----------------|-----------------------------|-----------------------|-----------------------|---|
| S.1 | Asbestos/Lead/Mold?Silica | <input type="radio"/> | <input type="radio"/> | |
| S.2 | Concrete cut wet & vacuumed | <input type="radio"/> | <input type="radio"/> | |
| S.3 | Containers labeled | <input type="radio"/> | <input type="radio"/> | |
| S.4 | Hazard material prop stored | <input type="radio"/> | <input type="radio"/> | |
| S.5 | Nuisance dust | <input type="radio"/> | <input type="radio"/> | |
| S.6 | Spill containment adequate | <input type="radio"/> | <input type="radio"/> | |

| T SITE/PUBLIC PROTECTION | | | S | U |
|--------------------------|---------------------------|-----------------------|-----------------------|---|
| T.1 | Public protection signage | <input type="radio"/> | <input type="radio"/> | |
| T.2 | Perimeter fences | <input type="radio"/> | <input type="radio"/> | |
| T.3 | Excavations protected | <input type="radio"/> | <input type="radio"/> | |
| T.4 | Faling object protection | <input type="radio"/> | <input type="radio"/> | |
| T.5 | Baricades installed prop | <input type="radio"/> | <input type="radio"/> | |
| T.6 | Adequate lighting | <input type="radio"/> | <input type="radio"/> | |
| T.7 | Street closure identified | <input type="radio"/> | <input type="radio"/> | |
| T.8 | Security system in place | <input type="radio"/> | <input type="radio"/> | |
| T.9 | Company rep present | <input type="radio"/> | <input type="radio"/> | |
| T.10 | Traffic Control Plan | <input type="radio"/> | <input type="radio"/> | |

| U MISCELLANEOUS | | | S | U |
|-----------------|--|-----------------------|-----------------------|---|
| U.1 | All employees trained on HASP; if applicable | <input type="radio"/> | <input type="radio"/> | |
| U.2 | All Subcontractors utilizing subcontractor JSA's | <input type="radio"/> | <input type="radio"/> | |
| U.3 | | | | |
| U.4 | | | | |
| U.5 | | | | |
| U.6 | | | | |
| U.7 | | | | |

Comments



Comments



Comments



| | | | |
|---------------------------|-----------------|---------|--------------------------|
| Inspection Date | M M • D D • Y Y | FORM ID | 10124674 |
| Inspected (First Name) | | | Inspected (Last Name) |
| Job Number | | | Site Location |
| Trade(s) | | | Description of Work |

use ● not ✗ not ✓ (S) Safe / (U) Unsafe

CONFINED SPACE (CONT.)

- | A | ADMINISTRATION CONTROLS | S | U |
|------|--|--------------------------|--------------------------|
| A.1 | JSA submitted each trade | <input type="checkbox"/> | <input type="checkbox"/> |
| A.2 | JSA Quality (Hazard ID & Control) | <input type="checkbox"/> | <input type="checkbox"/> |
| A.3 | JSA Quality (Work Description/Loc.) | <input type="checkbox"/> | <input type="checkbox"/> |
| A.4 | JSA Quality (Focus on three) | <input type="checkbox"/> | <input type="checkbox"/> |
| A.5 | JSA (Employee Sign-off) | <input type="checkbox"/> | <input type="checkbox"/> |
| A.6 | JSA (Eye Wash/Shower Loc.) | <input type="checkbox"/> | <input type="checkbox"/> |
| A.7 | JSA (Muster Point) | <input type="checkbox"/> | <input type="checkbox"/> |
| A.8 | JSA Recertified | <input type="checkbox"/> | <input type="checkbox"/> |
| A.9 | High Hazard JSA Completed where Applicable | <input type="checkbox"/> | <input type="checkbox"/> |
| A.10 | High Hazard JSA Re-certified if one was Applicable | <input type="checkbox"/> | <input type="checkbox"/> |
| A.11 | JJW Foreman Certified/Trained | <input type="checkbox"/> | <input type="checkbox"/> |

- | B | MEDICAL/EMERGENCY | S | U |
|-----|--------------------------------|--------------------------|--------------------------|
| B.1 | Automatic External Defib (AED) | <input type="checkbox"/> | <input type="checkbox"/> |
| B.2 | First Aid Kit | <input type="checkbox"/> | <input type="checkbox"/> |
| B.3 | First Aid / CPR available | <input type="checkbox"/> | <input type="checkbox"/> |
| B.4 | Eyewash Station(s) | <input type="checkbox"/> | <input type="checkbox"/> |
| B.5 | Emer Numbers Posted(hosp etc) | <input type="checkbox"/> | <input type="checkbox"/> |
| B.6 | Company Emer Contact Info | <input type="checkbox"/> | <input type="checkbox"/> |
| B.7 | JWW Team contact numbers | <input type="checkbox"/> | <input type="checkbox"/> |
| B.8 | Map to medical facility(s) | <input type="checkbox"/> | <input type="checkbox"/> |
| B.9 | Emergency Action Plan | <input type="checkbox"/> | <input type="checkbox"/> |

- | C | HAZARD COMMUNICATIONS | S | U |
|-----|-----------------------------|-----------------------|-----------------------|
| C.1 | Readily available | <input type="radio"/> | <input type="radio"/> |
| C.2 | Inventory List (MSDS) | <input type="radio"/> | <input type="radio"/> |
| C.3 | Proper labels on containers | <input type="radio"/> | <input type="radio"/> |
| C.4 | Employees trained | <input type="radio"/> | <input type="radio"/> |

- | D | PERMITS | S | U |
|-----|------------------------|-----------------------|-----------------------|
| D.1 | Hot Work | <input type="radio"/> | <input type="radio"/> |
| D.2 | Cold Work | <input type="radio"/> | <input type="radio"/> |
| D.3 | Roadway (for blocking) | <input type="radio"/> | <input type="radio"/> |
| D.4 | Fire Hydrant | <input type="radio"/> | <input type="radio"/> |

- | E | CRANES & HOISTING EQUIP. — S | U |
|------|--|---|
| E.1 | Proper Distance power lines/de-ener | <input type="checkbox"/> <input type="checkbox"/> |
| E.2 | Crane supported and level | <input type="checkbox"/> <input type="checkbox"/> |
| E.3 | Outrigger extend/mats in place | <input type="checkbox"/> <input type="checkbox"/> |
| E.4 | Anti Two Block device | <input type="checkbox"/> <input type="checkbox"/> |
| E.5 | Swing radius barricaded | <input type="checkbox"/> <input type="checkbox"/> |
| E.6 | Signal Person Identified & Trained | <input type="checkbox"/> <input type="checkbox"/> |
| E.7 | Lift Horn used | <input type="checkbox"/> <input type="checkbox"/> |
| E.8 | Loads properly secured | <input type="checkbox"/> <input type="checkbox"/> |
| E.9 | Weight of load verified | <input type="checkbox"/> <input type="checkbox"/> |
| E.10 | Rigging rated for proper Capacity | <input type="checkbox"/> <input type="checkbox"/> |
| E.11 | Slings Condition (Worn/Frayed/Label) | <input type="checkbox"/> <input type="checkbox"/> |
| E.12 | Tag line(s) used | <input type="checkbox"/> <input type="checkbox"/> |
| E.13 | Hands clear of the load | <input type="checkbox"/> <input type="checkbox"/> |
| E.14 | Rigging Inspected | <input type="checkbox"/> <input type="checkbox"/> |
| E.15 | Critical Lift Plan Completed if Applicable | <input type="checkbox"/> <input type="checkbox"/> |

- | F | CONFINED SPACE | S | U |
|-----|--------------------------------|-----------------------|-----------------------|
| F.1 | Is permit required? | <input type="radio"/> | <input type="radio"/> |
| F.2 | "Confined space" sign at entry | <input type="radio"/> | <input type="radio"/> |

- | | | | |
|------|-------------------------------|--------------------------|--------------------------|
| F.3 | "Standby" person at entry | <input type="checkbox"/> | <input type="checkbox"/> |
| F.4 | Prop barricaded if not in use | <input type="checkbox"/> | <input type="checkbox"/> |
| F.5 | Atmospheric conditions | <input type="checkbox"/> | <input type="checkbox"/> |
| F.6 | Atmos monitor equip in place | <input type="checkbox"/> | <input type="checkbox"/> |
| F.7 | Confined Space Training | <input type="checkbox"/> | <input type="checkbox"/> |
| F.8 | Sign-in/out log at the entry | <input type="checkbox"/> | <input type="checkbox"/> |
| F.9 | Sign-in/out log accurate | <input type="checkbox"/> | <input type="checkbox"/> |
| F.10 | Rescue plan/emergency map | <input type="checkbox"/> | <input type="checkbox"/> |

G **MANLIFTS, SCISSORS LIFTS,
AERIAL LIFTS** _____

- | | | | |
|------|--------------------------------|-----------------------|-----------------------|
| G.1 | Proper equipment for job | <input type="radio"/> | <input type="radio"/> |
| G.2 | Operating on flat surface | <input type="radio"/> | <input type="radio"/> |
| G.3 | Safe Dist maintained(10' Min.) | <input type="radio"/> | <input type="radio"/> |
| G.4 | Harness worn by occupants | <input type="radio"/> | <input type="radio"/> |
| G.5 | Tied to proper anch point | <input type="radio"/> | <input type="radio"/> |
| G.6 | Gate or chain secured | <input type="radio"/> | <input type="radio"/> |
| G.7 | Proper loading | <input type="radio"/> | <input type="radio"/> |
| G.8 | Equip Oper Manual with Lift | <input type="radio"/> | <input type="radio"/> |
| G.9 | Operator(s) training | <input type="radio"/> | <input type="radio"/> |
| G.10 | AWP JSA | <input type="radio"/> | <input type="radio"/> |

H SCAFFOLDS S U

- | | | | |
|------|---|--------------------------|--------------------------|
| H.1 | Surface in safe condition | <input type="checkbox"/> | <input type="checkbox"/> |
| H.2 | Wood/metal planks in safe conditions | <input type="checkbox"/> | <input type="checkbox"/> |
| H.3 | Sills,plates,jacks installed & secured | <input type="checkbox"/> | <input type="checkbox"/> |
| H.4 | Guardrails in place @ 6' | <input type="checkbox"/> | <input type="checkbox"/> |
| H.5 | Bracing and pins in place | <input type="checkbox"/> | <input type="checkbox"/> |
| H.6 | Proper access to platforms | <input type="checkbox"/> | <input type="checkbox"/> |
| H.7 | Overhead clearance on ladders (24") | <input type="checkbox"/> | <input type="checkbox"/> |
| H.8 | Properly secured to structure | <input type="checkbox"/> | <input type="checkbox"/> |
| H.9 | Proper loading of materials | <input type="checkbox"/> | <input type="checkbox"/> |
| H.10 | Deck is free of trash & debris | <input type="checkbox"/> | <input type="checkbox"/> |
| H.11 | Compatible components used | <input type="checkbox"/> | <input type="checkbox"/> |
| H.12 | Safe work distances | <input type="checkbox"/> | <input type="checkbox"/> |
| H.13 | Inspected daily | <input type="checkbox"/> | <input type="checkbox"/> |
| H.14 | Competent person present | <input type="checkbox"/> | <input type="checkbox"/> |
| H.15 | Confirm no conflicting work above/below | <input type="checkbox"/> | <input type="checkbox"/> |

EXCAVATIONS ————— S U

- | | | | |
|------|---|--------------------------|--------------------------|
| I.1 | Perimeter protection/barricade | <input type="checkbox"/> | <input type="checkbox"/> |
| I.2 | Sloped, benched, or shored properly | <input type="checkbox"/> | <input type="checkbox"/> |
| I.3 | Spoil 2' from edge | <input type="checkbox"/> | <input type="checkbox"/> |
| I.4 | Surface encumbrances | <input type="checkbox"/> | <input type="checkbox"/> |
| I.5 | Dewatering adequate | <input type="checkbox"/> | <input type="checkbox"/> |
| I.6 | Proper Egress- Ladder or Ramp | <input type="checkbox"/> | <input type="checkbox"/> |
| I.7 | Egress access within 25' | <input type="checkbox"/> | <input type="checkbox"/> |
| I.8 | Traffic Exposure | <input type="checkbox"/> | <input type="checkbox"/> |
| I.9 | One Call system used | <input type="checkbox"/> | <input type="checkbox"/> |
| I.10 | All Utilities clearly marked | <input type="checkbox"/> | <input type="checkbox"/> |
| I.11 | Utilities hand dug within 2 feet of utility | <input type="checkbox"/> | <input type="checkbox"/> |
| I.12 | Competent person present | <input type="checkbox"/> | <input type="checkbox"/> |
| I.13 | Inspected daily | <input type="checkbox"/> | <input type="checkbox"/> |
| I.14 | Excavation Pre-Plan | <input type="checkbox"/> | <input type="checkbox"/> |
| I.15 | Excav > 20' engineered | <input type="checkbox"/> | <input type="checkbox"/> |
| I.16 | EE working in protective system | <input type="checkbox"/> | <input type="checkbox"/> |
| I.17 | EE wear harness for Rescue | <input type="checkbox"/> | <input type="checkbox"/> |

J LADDERS / STAIRS ————— S U

- | | | | |
|------|-------------------------------|-----------------------|-----------------------|
| J.1 | Proper use of ladder | <input type="radio"/> | <input type="radio"/> |
| J.2 | Straight Ladder tied off | <input type="radio"/> | <input type="radio"/> |
| J.3 | Extension ladder 4:1 pitch | <input type="radio"/> | <input type="radio"/> |
| J.4 | Clear of debris/materials | <input type="radio"/> | <input type="radio"/> |
| J.5 | Safe work dist from hazards | <input type="radio"/> | <input type="radio"/> |
| J.6 | Properly guarded in roadways | <input type="radio"/> | <input type="radio"/> |
| J.7 | Inspected for defects | <input type="radio"/> | <input type="radio"/> |
| J.8 | Rails at stairs/landings | <input type="radio"/> | <input type="radio"/> |
| J.9 | Slip trip exposure elim | <input type="radio"/> | <input type="radio"/> |
| J.10 | Stairs illuminated | <input type="radio"/> | <input type="radio"/> |
| J.11 | Access break >19" | <input type="radio"/> | <input type="radio"/> |
| J.12 | Step ladders >6' tied off | <input type="radio"/> | <input type="radio"/> |
| J.13 | Step ladders-Spreaders locked | <input type="radio"/> | <input type="radio"/> |
| J.14 | EE uses 3 points of contact | <input type="radio"/> | <input type="radio"/> |

K STEEL ERECTION S U

- | | | | |
|-----|----------------------------------|-----------------------|-----------------------|
| K.1 | EE between 15-30' fall protect | <input type="radio"/> | <input type="radio"/> |
| K.2 | CDZ & CAZ training / utilized | <input type="radio"/> | <input type="radio"/> |
| K.3 | Proper anch of columns/beam | <input type="radio"/> | <input type="radio"/> |
| K.4 | Anch points Proper Capacity | <input type="radio"/> | <input type="radio"/> |
| K.5 | Struct flooring requirements | <input type="radio"/> | <input type="radio"/> |
| K.6 | Written approval conc strength | <input type="radio"/> | <input type="radio"/> |
| K.7 | Erector notified of modification | <input type="radio"/> | <input type="radio"/> |

L FALL PROTECTION _____ S U

- | | | | |
|------|-----------------------------------|-----------------------|-----------------------|
| L.1 | Fall protection at 6' | <input type="radio"/> | <input type="radio"/> |
| L.2 | Anch Points Proper Capacity | <input type="radio"/> | <input type="radio"/> |
| L.3 | Fall Prot effect-will Arrest fall | <input type="radio"/> | <input type="radio"/> |
| L.4 | Body Harness worn Properly | <input type="radio"/> | <input type="radio"/> |
| L.5 | Equipment Inspected | <input type="radio"/> | <input type="radio"/> |
| L.6 | Ext guardrail (roof/floor/edge) | <input type="radio"/> | <input type="radio"/> |
| L.7 | Int guardrail (wall/floor open) | <input type="radio"/> | <input type="radio"/> |
| L.8 | Stair/Ramp/walkway protected | <input type="radio"/> | <input type="radio"/> |
| L.9 | Floor cover adeq/secure/label | <input type="radio"/> | <input type="radio"/> |
| L.10 | Fall Protection Plan | <input type="radio"/> | <input type="radio"/> |

M FIRE PROTECTION S U

- | | | | |
|-----|--------------------------------|-----------------------|-----------------------|
| M.1 | Fire suppression equip avail | <input type="radio"/> | <input type="radio"/> |
| M.2 | Fire Ext-Monthly & Annual insp | <input type="radio"/> | <input type="radio"/> |
| M.3 | Prop signs in store areas | <input type="radio"/> | <input type="radio"/> |
| M.4 | Emergency vehicle access | <input type="radio"/> | <input type="radio"/> |
| M.5 | Fire Watch in place when req | <input type="radio"/> | <input type="radio"/> |

| N ELECTRICAL | | S | U |
|--------------|--------------------------------|-----------------------|-----------------------|
| N.1 | LO/TO procedures in place | <input type="radio"/> | <input type="radio"/> |
| N.2 | GFCI's used | <input type="radio"/> | <input type="radio"/> |
| N.3 | Branch Circuits Labeled | <input type="radio"/> | <input type="radio"/> |
| N.4 | Electric Cord proper rating | <input type="radio"/> | <input type="radio"/> |
| N.5 | Cords protected from traffic | <input type="radio"/> | <input type="radio"/> |
| N.6 | Cords in good condition | <input type="radio"/> | <input type="radio"/> |
| N.7 | Energized parts protected | <input type="radio"/> | <input type="radio"/> |
| N.8 | Proper use temp power boxes | <input type="radio"/> | <input type="radio"/> |
| N.9 | Signage present-i.e. High Volt | <input type="radio"/> | <input type="radio"/> |
| N.10 | Low Voltage Lighting | <input type="radio"/> | <input type="radio"/> |

| O MOTORIZED EQUIPMENT | | S | U |
|-----------------------|--|-----------------------|-----------------------|
| O.1 | Seat belts used | <input type="radio"/> | <input type="radio"/> |
| O.2 | Operator Conducts 360 Check | <input type="radio"/> | <input type="radio"/> |
| O.3 | Operator obeys Speed Limit | <input type="radio"/> | <input type="radio"/> |
| O.4 | Operator Avoids Backing, when possible | <input type="radio"/> | <input type="radio"/> |
| O.5 | Operator Backs First to Park,when possible | <input type="radio"/> | <input type="radio"/> |
| O.6 | Back up alarm functioning | <input type="radio"/> | <input type="radio"/> |
| O.7 | Light, Signals, Horn & Brakes functioning | <input type="radio"/> | <input type="radio"/> |
| O.8 | Windshield free of obstructions | <input type="radio"/> | <input type="radio"/> |
| O.9 | Flagman used if applicable | <input type="radio"/> | <input type="radio"/> |
| O.10 | Air Comp clear-Exhaust Fume Exp | <input type="radio"/> | <input type="radio"/> |
| O.11 | 3 Points of Contact used On/Off Vehicle | <input type="radio"/> | <input type="radio"/> |
| O.12 | EE Reports Vehicle Deficiencies | <input type="radio"/> | <input type="radio"/> |
| O.13 | Trailer properly hitched | <input type="radio"/> | <input type="radio"/> |
| O.14 | Cargo properly secured bed/trailer | <input type="radio"/> | <input type="radio"/> |

| P POWER TOOLS - AIR, ELECTRIC & POWDER ACTUATED | | S | U |
|---|-----------------------------------|-----------------------|-----------------------|
| P.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> |
| P.2 | Information label on tool | <input type="radio"/> | <input type="radio"/> |
| P.3 | Guard(s) in place | <input type="radio"/> | <input type="radio"/> |
| P.4 | Mfg. handles in place | <input type="radio"/> | <input type="radio"/> |
| P.5 | Tool in good condition | <input type="radio"/> | <input type="radio"/> |
| P.6 | Abrasv wheel in good condition | <input type="radio"/> | <input type="radio"/> |
| P.7 | Bit/blade - sharp/ good condition | <input type="radio"/> | <input type="radio"/> |
| P.8 | Elect cords & Equip- current insp | <input type="radio"/> | <input type="radio"/> |
| P.9 | Operator Licensed | <input type="radio"/> | <input type="radio"/> |
| P.10 | Air Couplings secure with Pins | <input type="radio"/> | <input type="radio"/> |
| P.11 | Tool Currently Inspected | <input type="radio"/> | <input type="radio"/> |

| Q HOUSEKEEPING | | S | U |
|----------------|-------------------------------------|-----------------------|-----------------------|
| Q.1 | Clear access to site | <input type="radio"/> | <input type="radio"/> |
| Q.2 | Slip, Trip, Fall Hazards | <input type="radio"/> | <input type="radio"/> |
| Q.3 | Tools & Equip stored properly | <input type="radio"/> | <input type="radio"/> |
| Q.4 | Materials stored properly | <input type="radio"/> | <input type="radio"/> |
| Q.5 | Trash/Debris in prop container | <input type="radio"/> | <input type="radio"/> |
| Q.6 | Low clearance areas flag/identified | <input type="radio"/> | <input type="radio"/> |
| Q.7 | Impalement prot (rebar cap etc) | <input type="radio"/> | <input type="radio"/> |
| Q.8 | Roadway around proj clear | <input type="radio"/> | <input type="radio"/> |
| Q.9 | Designated Parking | <input type="radio"/> | <input type="radio"/> |
| Q.10 | Proper Signage | <input type="radio"/> | <input type="radio"/> |

| R HAND TOOLS | | S | U |
|--------------|-----------------------------|-----------------------|-----------------------|
| R.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> |
| R.2 | Chisel/Hacksaw/Wedge-Cond | <input type="radio"/> | <input type="radio"/> |
| R.3 | Handles (not damaged) | <input type="radio"/> | <input type="radio"/> |
| R.4 | Jaws (not worn or damaged) | <input type="radio"/> | <input type="radio"/> |
| R.5 | Knock Wrench-Best Tech Used | <input type="radio"/> | <input type="radio"/> |
| R.6 | Hands-Out of Line of Fire | <input type="radio"/> | <input type="radio"/> |
| R.7 | Handle/Strap extension used | <input type="radio"/> | <input type="radio"/> |

| S P.P.E: PERSONAL PROTECTIVE EQUIPMENT | | S | U |
|--|---------------------------------------|-----------------------|-----------------------|
| S.1 | Hard Hat | <input type="radio"/> | <input type="radio"/> |
| S.2 | Safety Glasses | <input type="radio"/> | <input type="radio"/> |
| S.3 | Approp. Hearing protection | <input type="radio"/> | <input type="radio"/> |
| S.4 | Hi-visibility const vest | <input type="radio"/> | <input type="radio"/> |
| S.5 | Gloves | <input type="radio"/> | <input type="radio"/> |
| S.6 | Work Boots | <input type="radio"/> | <input type="radio"/> |
| S.7 | Metatarsal Protection | <input type="radio"/> | <input type="radio"/> |
| S.8 | PPE Stored properly | <input type="radio"/> | <input type="radio"/> |
| S.9 | Respirators proper for task | <input type="radio"/> | <input type="radio"/> |
| S.10 | Respirator cartridges proper for task | <input type="radio"/> | <input type="radio"/> |
| S.11 | Face Shield | <input type="radio"/> | <input type="radio"/> |
| S.12 | Fire Retardant Clothing | <input type="radio"/> | <input type="radio"/> |
| S.13 | SCBA | <input type="radio"/> | <input type="radio"/> |

| T ENVIRONMENTAL | | S | U |
|-----------------|-----------------------------|-----------------------|-----------------------|
| T.1 | Asbestos/Lead/Mold/Silica | <input type="radio"/> | <input type="radio"/> |
| T.2 | Concrete cut wet & vacuumed | <input type="radio"/> | <input type="radio"/> |
| T.3 | Containers labeled | <input type="radio"/> | <input type="radio"/> |
| T.4 | Hazard material prop stored | <input type="radio"/> | <input type="radio"/> |
| T.5 | Nuisance dust | <input type="radio"/> | <input type="radio"/> |
| T.6 | Spill containment adequate | <input type="radio"/> | <input type="radio"/> |

| U SITE / PUBLIC PROTECTION | | S | U |
|----------------------------|---------------------------|-----------------------|-----------------------|
| U.1 | Public protection signage | <input type="radio"/> | <input type="radio"/> |
| U.2 | Perimeter fences | <input type="radio"/> | <input type="radio"/> |
| U.3 | Excavations protected | <input type="radio"/> | <input type="radio"/> |
| U.4 | Falling object protection | <input type="radio"/> | <input type="radio"/> |
| U.5 | Barricades installed prop | <input type="radio"/> | <input type="radio"/> |
| U.6 | Adequate lighting | <input type="radio"/> | <input type="radio"/> |
| U.7 | Street closure identified | <input type="radio"/> | <input type="radio"/> |
| U.8 | Security system in place | <input type="radio"/> | <input type="radio"/> |
| U.9 | Company rep present | <input type="radio"/> | <input type="radio"/> |
| U.10 | Traffic Control plan | <input type="radio"/> | <input type="radio"/> |

| V MISCELLANEOUS | | S | U |
|-----------------|--|-----------------------|-----------------------|
| V.1 | All employees trained on HASP; if applicable | <input type="radio"/> | <input type="radio"/> |
| V.2 | All Subcontractors utilizing subcontractor JSA's | <input type="radio"/> | <input type="radio"/> |
| V.3 | | | |
| V.4 | | | |
| V.5 | | | |
| V.6 | | | |
| V.7 | | | |

FORM ID: 10124674

Comments



Comments



Comments



Inspection Date: M M . D D . Y Y

Inspected By (First Name):

Inspected By (Last Name):

Job Number:

Site Location:

Trade(s):

Description of Work:

 use ☒ not ☒ not ☒ (S) Safe / (U) Unsafe

FORM 50 10124785

A ADMINISTRATION CONTROLS S U

- A.1 Unit Sign-in & Sign-out ☐ ☐
- A.2 JSA submitted each trade ☐ ☐
- A.3 JSA Quality (Hazard ID & Control) ☐ ☐
- A.4 JSA Quality (Work Description/Loc.) ☐ ☐
- A.5 JSA Quality (Focus on three) ☐ ☐
- A.6 JSA (Employee Sign-off) ☐ ☐
- A.7 JSA (Eye Wash/Shower Loc.) ☐ ☐
- A.8 JSA (Muster Point) ☐ ☐
- A.9 JSA Recertified ☐ ☐
- A.10 High Hazard JSA Completed where Applicable ☐ ☐
- A.11 High Hazard JSA Recertified if one was Applicable ☐ ☐
- A.12 JJW Foreman Certified/Trained ☐ ☐

B MEDICAL/EMERGENCY S U

- B.1 Automatic External Defib (AED) ☐ ☐
- B.2 First Aid Kit ☐ ☐
- B.3 First Aid / CPR available ☐ ☐
- B.4 Eyewash Station(s) ☐ ☐
- B.5 Emer Numbers Posted (hosp etc) ☐ ☐
- B.6 Company Emer Contact Info ☐ ☐
- B.7 JJW Team contact numbers ☐ ☐
- B.8 Map to medical facility(s) ☐ ☐
- B.9 Emergency Action Plan ☐ ☐

C HAZARD COMMUNICATIONS S U

- C.1 Readily available ☐ ☐
- C.2 Inventory List (MSDS) ☐ ☐
- C.3 Proper labels on containers ☐ ☐
- C.4 Employees trained ☐ ☐

D PERMITS S U

- D.1 Hot work ☐ ☐
- D.2 Confined Space ☐ ☐
- D.3 Vehicle Entry ☐ ☐
- D.4 Roadway (for blocking) ☐ ☐
- D.5 Critical Lift ☐ ☐
- D.6 Fire Hydrant (water usage) ☐ ☐
- D.7 Cold work ☐ ☐

E CRANES & HOISTING EQUIP. S U

- E.1 Proper Distance power lines/de-ener ☐ ☐
- E.2 Crane supported and level ☐ ☐
- E.3 Outrigger extend/mats in place ☐ ☐
- E.4 Anti Two Block device ☐ ☐
- E.5 Swing radius barricaded ☐ ☐
- E.6 Signal Person Identified & Trained ☐ ☐
- E.7 Lift Horn used ☐ ☐
- E.8 Loads properly secured ☐ ☐
- E.9 Weight of load verified ☐ ☐
- E.10 Rigging rated for proper Capacity ☐ ☐
- E.11 Slings Condition (Worn/Frayed/Label) ☐ ☐
- E.12 Tag line(s) used ☐ ☐
- E.13 Hands clear of the load ☐ ☐
- E.14 Cert or verify training ☐ ☐
- E.15 Proper use of "CAZ" id ☐ ☐

CRANES & HOISTING EQUIP. (Cont.) S U

- E.16 Rigging Inspected ☐ ☐
- E.17 Critical Lift Plan Completed if Applicable ☐ ☐
- F CONFINED SPACE S U**
- F.1 Is permit required? ☐ ☐
- F.2 "Confined space" sign at entry ☐ ☐
- F.3 "Standby" person at entry ☐ ☐
- F.4 Prop barricaded if not in use ☐ ☐
- F.5 Atmospheric conditions ☐ ☐
- F.6 Atmos monitor equip in place ☐ ☐
- F.7 Confined Space Training ☐ ☐
- F.8 Sign-in/out log at the entry ☐ ☐
- F.9 Sign-in/out log accurate ☐ ☐
- F.10 Rescue plan/emerg #s/map ☐ ☐

G MANLIFTS, SCISSORS LIFTS, AERIAL LIFTS S U

- G.1 Proper equipment for job ☐ ☐
- G.2 Operating on flat surface ☐ ☐
- G.3 Safe Dist maintained (10' Min.) ☐ ☐
- G.4 Harness worn by occupants ☐ ☐
- G.5 Tied to proper anchor point ☐ ☐
- G.6 Gate or chain secured ☐ ☐
- G.7 Proper loading ☐ ☐
- G.8 Equip Oper Manual with Lift ☐ ☐
- G.9 Operator(s) training ☐ ☐

H SCAFFOLDS S U

- H.1 Surface in safe condition ☐ ☐
- H.2 Wood/metal planks in safe conditions ☐ ☐
- H.3 Guardrails in place @ 6' ☐ ☐
- H.4 Proper access to platforms ☐ ☐
- H.5 Overhead clearance on ladders (24") ☐ ☐
- H.6 Properly secured to structure ☐ ☐
- H.7 Proper loading of materials ☐ ☐
- H.8 Deck is free of trash & debris ☐ ☐
- H.9 Compatible components used ☐ ☐
- H.10 Safe work distances ☐ ☐
- H.11 Inspected daily ☐ ☐
- H.12 Competent person present ☐ ☐
- H.13 Confirm no conflicting work above/below ☐ ☐

I LADDERS / STAIRS S U

- I.1 Proper use of ladder ☐ ☐
- I.2 Job-built ladders secured ☐ ☐
- I.3 Job-built ladder const properly ☐ ☐
- I.4 Clear of debris/materials ☐ ☐
- I.5 Safe work dist from hazards ☐ ☐
- I.6 Inspected for defects ☐ ☐
- I.7 Step ladders-Spreaders locked ☐ ☐
- I.8 EE uses 3 points of contact ☐ ☐

J RESPIRATORY PROTECTION S U

- J.1 Employee(s): Clean Shaven ☐ ☐
- J.2 Employee(s): Medically Cleared ☐ ☐
- J.3 Employee(s): Trained & Fit Test ☐ ☐
- J.4 Resp. stored properly ☐ ☐
- J.5 Correct type for the hazard ☐ ☐
- J.6 Proper cartridge ☐ ☐
- J.7 Fresh Air Zone Setup ☐ ☐
- J.8 FA- Bottlewatch present ☐ ☐
- J.9 FA- Bottles outside barricade ☐ ☐
- J.10 FA- Bottle watch has horn ☐ ☐
- J.11 FA- Gauges/Bell in good condition ☐ ☐
- J.12 FA- Safety Standby present ☐ ☐
- J.13 Safety trained in First Aid/CPR ☐ ☐
- J.14 FA- Separate bottles for Safety ☐ ☐
- J.15 FA- Radio to summon emer services ☐ ☐
- J.16 FA- <300' of air line each person ☐ ☐
- J.17 FA- 2 egress points avail. ☐ ☐

K FALL PROTECTION S U

- K.1 Fall protection at 6' ☐ ☐
- K.2 Anch Points Proper Capacity ☐ ☐
- K.3 Fall Prot effect-will Arrest fall ☐ ☐
- K.4 Body Harness worn Properly ☐ ☐
- K.5 Equipment Inspected ☐ ☐
- K.6 Ext guardrail (roof/floor/edge) ☐ ☐
- K.7 Int guardrail (wall/floor open) ☐ ☐
- K.8 Stair/Ramp/walkway protected ☐ ☐
- K.9 Floor cover adeq/secure/label ☐ ☐
- K.10 Fall Protection Plan ☐ ☐

L FIRE PROTECTION S U

- L.1 Fire suppression equip avail ☐ ☐
- L.2 Fire Ext-Monthly & Annual Insp ☐ ☐
- L.3 Prop signs in store areas ☐ ☐
- L.4 Emergency vehicle access ☐ ☐
- L.5 Air Monitor-Hot Work<10%LEL ☐ ☐
- L.6 Fire Watch in place when req ☐ ☐

M WELDING / CUTTING S U

- M.1 Gas Cylinders stored properly ☐ ☐
- M.2 Gauges & Torch in good condition ☐ ☐
- M.3 Flash Arrest on Burn/Cut torch ☐ ☐
- M.4 Weld Screen(s)-Where Required ☐ ☐
- M.5 Comb/Flam're away frm weld ops ☐ ☐
- M.6 Ankle strap/ bib for pos weld ☐ ☐
- M.7 Leads in good condition ☐ ☐
- M.8 Welding Machine ventilated ☐ ☐
- M.9 Gauges working properly ☐ ☐
- M.10 Fire Blanket in place when required ☐ ☐

| N | ELECTRICAL | S | U |
|-----|------------------------------|-----------------------|-----------------------|
| N.1 | LO/TO procedures in place | <input type="radio"/> | <input type="radio"/> |
| N.2 | GFCI's used | <input type="radio"/> | <input type="radio"/> |
| N.3 | Electric Cord proper rating | <input type="radio"/> | <input type="radio"/> |
| N.4 | Cords protected from traffic | <input type="radio"/> | <input type="radio"/> |
| N.5 | Cords in good condition | <input type="radio"/> | <input type="radio"/> |
| N.6 | Proper use temp power boxes | <input type="radio"/> | <input type="radio"/> |

| O | MOTORIZED EQUIPMENT | S | U |
|------|---|-----------------------|-----------------------|
| O.1 | Seat belts used | <input type="radio"/> | <input type="radio"/> |
| O.2 | Operator Conducts 360 Check | <input type="radio"/> | <input type="radio"/> |
| O.3 | Operator obeys Speed Limit | <input type="radio"/> | <input type="radio"/> |
| O.4 | Operator Avoids Backing, when possible | <input type="radio"/> | <input type="radio"/> |
| O.5 | Operator Backs First to Park, when possible | <input type="radio"/> | <input type="radio"/> |
| O.6 | Back up alarm functioning | <input type="radio"/> | <input type="radio"/> |
| O.7 | Light, Signals, Horn & Brakes functioning | <input type="radio"/> | <input type="radio"/> |
| O.8 | Windshield free of obstructions | <input type="radio"/> | <input type="radio"/> |
| O.9 | Flagman used if applicable | <input type="radio"/> | <input type="radio"/> |
| O.10 | Air Comp clear-Exhaust Fume Exp | <input type="radio"/> | <input type="radio"/> |
| O.11 | 3 Points of Contact used On/Off Vehicle | <input type="radio"/> | <input type="radio"/> |
| O.12 | EE Reports Vehicle Deficiencies | <input type="radio"/> | <input type="radio"/> |
| O.13 | Trailer properly hitched | <input type="radio"/> | <input type="radio"/> |
| O.14 | Cargo properly secured bed/trailer | <input type="radio"/> | <input type="radio"/> |

| P | POWER TOOLS - AIR, ELECTRIC & POWDER ACTUATED | S | U |
|------|--|-----------------------|-----------------------|
| P.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> |
| P.2 | Information label on tool | <input type="radio"/> | <input type="radio"/> |
| P.3 | Guard(s) in place | <input type="radio"/> | <input type="radio"/> |
| P.4 | Mfg. handles in place | <input type="radio"/> | <input type="radio"/> |
| P.5 | Tool in good condition | <input type="radio"/> | <input type="radio"/> |
| P.6 | Abrasv wheel in good condition | <input type="radio"/> | <input type="radio"/> |
| P.7 | Bit/blade - sharp/ good condition | <input type="radio"/> | <input type="radio"/> |
| P.8 | Elect cords & Equip- current insp | <input type="radio"/> | <input type="radio"/> |
| P.9 | Operator Licensed | <input type="radio"/> | <input type="radio"/> |
| P.10 | Air Couplings secure with Pins | <input type="radio"/> | <input type="radio"/> |
| P.11 | Tools Currently Inspected | <input type="radio"/> | <input type="radio"/> |

| Q | HOUSEKEEPING | S | U |
|------|-------------------------------------|-----------------------|-----------------------|
| Q.1 | Clear access to site | <input type="radio"/> | <input type="radio"/> |
| Q.2 | Slip, Trip, Fall Hazards | <input type="radio"/> | <input type="radio"/> |
| Q.3 | Tools & Equip stored properly | <input type="radio"/> | <input type="radio"/> |
| Q.4 | Materials stored properly | <input type="radio"/> | <input type="radio"/> |
| Q.5 | Trash/Debris in prop container | <input type="radio"/> | <input type="radio"/> |
| Q.6 | Low clearance areas flag/identified | <input type="radio"/> | <input type="radio"/> |
| Q.7 | Impalement prot (rebar cap etc) | <input type="radio"/> | <input type="radio"/> |
| Q.8 | Roadway around proj clear | <input type="radio"/> | <input type="radio"/> |
| Q.9 | Designated Parking | <input type="radio"/> | <input type="radio"/> |
| Q.10 | Proper Signage | <input type="radio"/> | <input type="radio"/> |

| R | HAND TOOLS | S | U |
|-----|-----------------------------|-----------------------|-----------------------|
| R.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> |
| R.2 | Chisel/Hacksaw/Wedge-Cond | <input type="radio"/> | <input type="radio"/> |
| R.3 | Handles (not damaged) | <input type="radio"/> | <input type="radio"/> |
| R.4 | Jaws (not worn or damaged) | <input type="radio"/> | <input type="radio"/> |
| R.5 | Knock Wrench-Best Tech Used | <input type="radio"/> | <input type="radio"/> |
| R.6 | Hands-Out of Line of Fire | <input type="radio"/> | <input type="radio"/> |
| R.7 | Handle/Strap extension used | <input type="radio"/> | <input type="radio"/> |

| S | P.P.E: PERSONAL PROTECTIVE EQUIPMENT | S | U |
|------|---|-----------------------|-----------------------|
| S.1 | Hard Hat | <input type="radio"/> | <input type="radio"/> |
| S.2 | Monogoggles | <input type="radio"/> | <input type="radio"/> |
| S.3 | Safety Glasses | <input type="radio"/> | <input type="radio"/> |
| S.4 | Glasses / face shields | <input type="radio"/> | <input type="radio"/> |
| S.5 | Approp. Hearing protection | <input type="radio"/> | <input type="radio"/> |
| S.6 | Personal Monitors(H2S,O2 etc) | <input type="radio"/> | <input type="radio"/> |
| S.7 | Nomex | <input type="radio"/> | <input type="radio"/> |
| S.8 | Req Chemical Clothing worn | <input type="radio"/> | <input type="radio"/> |
| S.9 | Hi-visibility const vest | <input type="radio"/> | <input type="radio"/> |
| S.10 | Gloves | <input type="radio"/> | <input type="radio"/> |
| S.11 | Sleeve roll down zip secure | <input type="radio"/> | <input type="radio"/> |
| S.12 | Work Boots | <input type="radio"/> | <input type="radio"/> |
| S.13 | Metatarsal protection | <input type="radio"/> | <input type="radio"/> |
| S.14 | PPE Stored properly | <input type="radio"/> | <input type="radio"/> |
| S.15 | Respirators proper for task | <input type="radio"/> | <input type="radio"/> |
| S.16 | Respirator cartridges proper for task | <input type="radio"/> | <input type="radio"/> |
| S.17 | Face Shield | <input type="radio"/> | <input type="radio"/> |
| S.18 | Fire Retardant Clothing | <input type="radio"/> | <input type="radio"/> |
| S.19 | SCBA | <input type="radio"/> | <input type="radio"/> |

| T | ENVIRONMENTAL | S | U |
|-----|-----------------------------|-----------------------|-----------------------|
| T.1 | Asbestos/Lead/Mold/Silica | <input type="radio"/> | <input type="radio"/> |
| T.2 | Concrete cut wet & vacuumed | <input type="radio"/> | <input type="radio"/> |
| T.3 | Containers labeled | <input type="radio"/> | <input type="radio"/> |
| T.4 | Hazard material prop stored | <input type="radio"/> | <input type="radio"/> |
| T.5 | Nuisance dust | <input type="radio"/> | <input type="radio"/> |
| T.6 | Spill containment adequate | <input type="radio"/> | <input type="radio"/> |

| U | SITE / PUBLIC PROTECTION | S | U |
|------|---------------------------|-----------------------|-----------------------|
| U.1 | Public protection signage | <input type="radio"/> | <input type="radio"/> |
| U.2 | Perimeter fences | <input type="radio"/> | <input type="radio"/> |
| U.3 | Excavations protected | <input type="radio"/> | <input type="radio"/> |
| U.4 | Falling object protection | <input type="radio"/> | <input type="radio"/> |
| U.5 | Barricades installed prop | <input type="radio"/> | <input type="radio"/> |
| U.6 | Adequate lighting | <input type="radio"/> | <input type="radio"/> |
| U.7 | Street closure identified | <input type="radio"/> | <input type="radio"/> |
| U.8 | Security system in place | <input type="radio"/> | <input type="radio"/> |
| U.9 | Company rep present | <input type="radio"/> | <input type="radio"/> |
| U.10 | Traffic Control plan | <input type="radio"/> | <input type="radio"/> |

| V | MISCELLANEOUS | S | U |
|-----|--|-----------------------|-----------------------|
| V.1 | All employees trained on HASP; if applicable | <input type="radio"/> | <input type="radio"/> |
| V.2 | All Subcontractors utilizing subcontractor JSA's | <input type="radio"/> | <input type="radio"/> |
| V.3 | | | |
| V.4 | | | |
| V.5 | | | |
| V.6 | | | |
| V.7 | | | |

FORM ID 10124785

Comments



Comments



Comments



Inspection Date M M D D Y Y

Inspected By (First Name)

Inspected By (Last Name)

Job Number

Site Location

Trade(s)

Description of Work

use ☒ not ☒ (S) Safe / (U) Unsafe

FORM ID 10124896

| | | |
|--|---|--|
| A ADMINISTRATION CONTROLS S U | F CRANES & HOISTING EQUIP. S U | LADDERS/STAIRS (Cont.) S U |
| A.1 Unit sign-in & sign-out <input type="radio"/> <input type="radio"/> | F.1 Proper Distance power lines/de-ener <input type="radio"/> <input type="radio"/> | I.7 Inspected for defects <input type="radio"/> <input type="radio"/> |
| A.2 JSA submitted each trade <input type="radio"/> <input type="radio"/> | F.2 Crane supported and level <input type="radio"/> <input type="radio"/> | I.8 Rails at stairs/landings <input type="radio"/> <input type="radio"/> |
| A.3 JSA Quality (Hazard ID & Control) <input type="radio"/> <input type="radio"/> | F.3 Outtrigger extend/mats in place <input type="radio"/> <input type="radio"/> | I.9 Slip trip exposure elim <input type="radio"/> <input type="radio"/> |
| A.4 JSA Quality(Work Description/Loc.) <input type="radio"/> <input type="radio"/> | F.4 Anti Two Block device <input type="radio"/> <input type="radio"/> | I.10 Stairs illuminated <input type="radio"/> <input type="radio"/> |
| A.5 JSA (Focus on three) <input type="radio"/> <input type="radio"/> | F.5 Swing radius barricaded <input type="radio"/> <input type="radio"/> | I.11 Access break >19" <input type="radio"/> <input type="radio"/> |
| A.6 JSA (Employee Sign-off) <input type="radio"/> <input type="radio"/> | F.6 Signal Person Identified & Trained <input type="radio"/> <input type="radio"/> | I.12 Step ladders >6' tied off <input type="radio"/> <input type="radio"/> |
| A.7 JSA (Eye Wash/Shower Loc.) <input type="radio"/> <input type="radio"/> | F.7 Lift Horn used <input type="radio"/> <input type="radio"/> | I.13 Step ladders-Spreaders locked <input type="radio"/> <input type="radio"/> |
| A.8 JSA (Muster Point) <input type="radio"/> <input type="radio"/> | F.8 Loads properly secured <input type="radio"/> <input type="radio"/> | I.14 EE uses 3 points of contact <input type="radio"/> <input type="radio"/> |
| A.9 JSA Recertified <input type="radio"/> <input type="radio"/> | F.9 Weight of load verified <input type="radio"/> <input type="radio"/> | |
| A.10 High Hazard JSA Completed where Applicable <input type="radio"/> <input type="radio"/> | F.10 Rigging rated for proper Capacity <input type="radio"/> <input type="radio"/> | |
| A.11 High Hazard JSA Recertified if one was Applicable <input type="radio"/> <input type="radio"/> | F.11 Slings Condition (Worn/Frayed/Label) <input type="radio"/> <input type="radio"/> | |
| A.12 JJW Foreman Certified/Trained <input type="radio"/> <input type="radio"/> | F.12 Tag line(s) used <input type="radio"/> <input type="radio"/> | |
| | F.13 Hands clear of the load <input type="radio"/> <input type="radio"/> | J STEEL ERECTION S U |
| B MEDICAL/EMERGENCY S U | F.14 Cert or verify training <input type="radio"/> <input type="radio"/> | J.1 EE >30' protect-6' in Refineries <input type="radio"/> <input type="radio"/> |
| B.1 Automatic External Defib (AED) <input type="radio"/> <input type="radio"/> | F.15 Proper use of "CAZ" id <input type="radio"/> <input type="radio"/> | J.2 EE between 15-30' fall protect <input type="radio"/> <input type="radio"/> |
| B.2 First Aid Kit <input type="radio"/> <input type="radio"/> | F.16 Rigging Inspected <input type="radio"/> <input type="radio"/> | J.3 CDZ & CAZ training / utilized <input type="radio"/> <input type="radio"/> |
| B.3 First Aid / CPR available <input type="radio"/> <input type="radio"/> | F.17 Critical Lift Plan Completed if Applicable <input type="radio"/> <input type="radio"/> | J.4 Proper anch of columns/beam <input type="radio"/> <input type="radio"/> |
| B.4 Eyewash Station(s) <input type="radio"/> <input type="radio"/> | | J.5 Anch points Proper Capacity <input type="radio"/> <input type="radio"/> |
| B.5 Emer Numbers Posted(hosp etc) <input type="radio"/> <input type="radio"/> | G MANLIFTS, SCISSORS LIFTS, AERIAL LIFTS S U | J.6 Site layout / sequence plan <input type="radio"/> <input type="radio"/> |
| B.6 Company Emer Contact Info <input type="radio"/> <input type="radio"/> | G.1 Proper equipment for job <input type="radio"/> <input type="radio"/> | J.7 Struct flooring requirements <input type="radio"/> <input type="radio"/> |
| B.7 JJW Team contact numbers <input type="radio"/> <input type="radio"/> | G.2 Operating on flat surface <input type="radio"/> <input type="radio"/> | J.8 Written approv conc strength <input type="radio"/> <input type="radio"/> |
| B.8 Map to medical facility(s) <input type="radio"/> <input type="radio"/> | G.3 Safe Dist maintained(10' Min.) <input type="radio"/> <input type="radio"/> | J.9 Erector notified of modification <input type="radio"/> <input type="radio"/> |
| B.9 Emergency Action Plan <input type="radio"/> <input type="radio"/> | G.4 Harness worn by occupants <input type="radio"/> <input type="radio"/> | |
| | G.5 Tied to proper anch point <input type="radio"/> <input type="radio"/> | K RESPIRATORY PROTECTION S U |
| C HAZARD COMMUNICATIONS S U | G.6 Gate or chain secured <input type="radio"/> <input type="radio"/> | K.1 Employee(s): Clean Shaven <input type="radio"/> <input type="radio"/> |
| C.1 Readily available <input type="radio"/> <input type="radio"/> | G.7 Proper loading <input type="radio"/> <input type="radio"/> | K.2 Employee(s): Medically Cleared <input type="radio"/> <input type="radio"/> |
| C.2 Inventory List (MSDS) <input type="radio"/> <input type="radio"/> | G.8 Equip Oper Manual with Lift <input type="radio"/> <input type="radio"/> | K.3 Employee(s): Trained & Fit Test <input type="radio"/> <input type="radio"/> |
| C.3 Proper labels on containers <input type="radio"/> <input type="radio"/> | G.9 Operator(s) training <input type="radio"/> <input type="radio"/> | K.4 Resp. stored properly <input type="radio"/> <input type="radio"/> |
| C.4 Employees trained <input type="radio"/> <input type="radio"/> | G.10 AWP JSA <input type="radio"/> <input type="radio"/> | K.5 Correct type for the hazard <input type="radio"/> <input type="radio"/> |
| | | K.6 Proper cartridge <input type="radio"/> <input type="radio"/> |
| D PERMITS S U | H SCAFFOLDS S U | K.7 Fresh Air Zone Setup <input type="radio"/> <input type="radio"/> |
| D.1 Hot Work <input type="radio"/> <input type="radio"/> | H.1 Surface in safe condition <input type="radio"/> <input type="radio"/> | K.8 FA- Bottletwatch present <input type="radio"/> <input type="radio"/> |
| D.2 Confined Space <input type="radio"/> <input type="radio"/> | H.2 Wood/metal planks in safe conditions <input type="radio"/> <input type="radio"/> | K.9 FA- Bottles outside barricade <input type="radio"/> <input type="radio"/> |
| D.3 Excavation/Digging <input type="radio"/> <input type="radio"/> | H.3 Sills,plates,jacks installed & secured <input type="radio"/> <input type="radio"/> | K.10 FA- Bottle watch has horn <input type="radio"/> <input type="radio"/> |
| D.4 Vehicle Entry <input type="radio"/> <input type="radio"/> | H.4 Guardrails in place @ 6' <input type="radio"/> <input type="radio"/> | K.11 FA- Gauges/Bell in good condition <input type="radio"/> <input type="radio"/> |
| D.5 Energized Electrical System <input type="radio"/> <input type="radio"/> | H.5 Bracing and pins in place <input type="radio"/> <input type="radio"/> | K.12 FA- Safety Standby present <input type="radio"/> <input type="radio"/> |
| D.6 Roadway(for blocking) <input type="radio"/> <input type="radio"/> | H.6 Proper access to platforms <input type="radio"/> <input type="radio"/> | K.13 Safety trained in First Aid/CPR <input type="radio"/> <input type="radio"/> |
| D.7 Citical Lift <input type="radio"/> <input type="radio"/> | H.7 Overhead clearance on ladders (24") <input type="radio"/> <input type="radio"/> | K.14 FA- Separate bottles for Safety <input type="radio"/> <input type="radio"/> |
| D.8 Fire Hydrant (water usage) <input type="radio"/> <input type="radio"/> | H.8 Properly secured to structure <input type="radio"/> <input type="radio"/> | K.15 FA- Radio to summon emer services <input type="radio"/> <input type="radio"/> |
| D.9 Cold Work <input type="radio"/> <input type="radio"/> | H.9 Proper loading of materials <input type="radio"/> <input type="radio"/> | K.16 FA- <300' of air line each person <input type="radio"/> <input type="radio"/> |
| | H.10 Deck is free of trash & debris <input type="radio"/> <input type="radio"/> | K.17 FA- 2 egress points avail. <input type="radio"/> <input type="radio"/> |
| E CONFINED SPACE S U | H.11 Compatible components used <input type="radio"/> <input type="radio"/> | |
| E.1 Is permit required? <input type="radio"/> <input type="radio"/> | H.12 Safe work distances <input type="radio"/> <input type="radio"/> | L FALL PROTECTION S U |
| E.2 "Confined space" sign at entry <input type="radio"/> <input type="radio"/> | H.13 Inspected daily <input type="radio"/> <input type="radio"/> | L.1 Fall protection at 6' <input type="radio"/> <input type="radio"/> |
| E.3 "Standby" person at entry <input type="radio"/> <input type="radio"/> | H.14 Competent person present <input type="radio"/> <input type="radio"/> | L.2 Anch Points Proper Capacity <input type="radio"/> <input type="radio"/> |
| E.4 Prop barricaded if not in use <input type="radio"/> <input type="radio"/> | H.15 Confirm no conflicting work above/below <input type="radio"/> <input type="radio"/> | L.3 Fall Prot effect-will Arrest fall <input type="radio"/> <input type="radio"/> |
| E.5 Atmospheric conditions <input type="radio"/> <input type="radio"/> | | L.4 Body Harness worn Properly <input type="radio"/> <input type="radio"/> |
| E.6 Atmos monitor equip in place <input type="radio"/> <input type="radio"/> | I LADDERS / STAIRS S U | L.5 Equipment Inspected <input type="radio"/> <input type="radio"/> |
| E.7 Confined Space Training <input type="radio"/> <input type="radio"/> | I.1 Proper use of ladder <input type="radio"/> <input type="radio"/> | L.6 Ext guardrail(roof/floor/edge) <input type="radio"/> <input type="radio"/> |
| E.8 Sign-in/out log at the entry <input type="radio"/> <input type="radio"/> | I.2 Straight Ladder tied off <input type="radio"/> <input type="radio"/> | L.7 Int guardrail (wall/floor open) <input type="radio"/> <input type="radio"/> |
| E.9 Sign-in/out log accurate <input type="radio"/> <input type="radio"/> | I.3 Extension ladder 4:1 pitch <input type="radio"/> <input type="radio"/> | L.8 Stair/Ramp/walkway protected <input type="radio"/> <input type="radio"/> |
| E.10 Rescue plan/emerg #s/map <input type="radio"/> <input type="radio"/> | I.4 Clear of debris/materials <input type="radio"/> <input type="radio"/> | L.9 Floor cover adeq/secure/label <input type="radio"/> <input type="radio"/> |
| | I.5 Safe work dist from hazards <input type="radio"/> <input type="radio"/> | L.10 Fall Protection Plan <input type="radio"/> <input type="radio"/> |
| | I.6 Properly guarded in roadways <input type="radio"/> <input type="radio"/> | |

| M | FIRE PROTECTION | S | U |
|-----|--------------------------------|-----------------------|-----------------------|
| M.1 | Fire suppression equip avail | <input type="radio"/> | <input type="radio"/> |
| M.2 | Fire Ext-Monthly & Annual insp | <input type="radio"/> | <input type="radio"/> |
| M.3 | Prop signs in store areas | <input type="radio"/> | <input type="radio"/> |
| M.4 | Emergency vehicle access | <input type="radio"/> | <input type="radio"/> |
| M.5 | Air Monitor-Hot Work<10%LEL | <input type="radio"/> | <input type="radio"/> |
| M.6 | Fire Watch in place when req | <input type="radio"/> | <input type="radio"/> |

| N | WELDING / CUTTING | S | U |
|------|-------------------------------------|-----------------------|-----------------------|
| N.1 | Gas Cylinders stored properly | <input type="radio"/> | <input type="radio"/> |
| N.2 | Gauges & Torch in good condition | <input type="radio"/> | <input type="radio"/> |
| N.3 | Flash Arrest on Burn/Cut torch | <input type="radio"/> | <input type="radio"/> |
| N.4 | Weld Screen(s)-Where Required | <input type="radio"/> | <input type="radio"/> |
| N.5 | Comb/Flam're away frm weld ops | <input type="radio"/> | <input type="radio"/> |
| N.6 | Ankle strap/ bib for pos weld | <input type="radio"/> | <input type="radio"/> |
| N.7 | Leads in good condition | <input type="radio"/> | <input type="radio"/> |
| N.8 | Welding Machin Ventilated | <input type="radio"/> | <input type="radio"/> |
| N.9 | Gauges working properly | <input type="radio"/> | <input type="radio"/> |
| N.10 | Fire Blanket in place when required | <input type="radio"/> | <input type="radio"/> |

| O | ELECTRICAL | S | U |
|------|--------------------------------|-----------------------|-----------------------|
| O.1 | LO/TO procedures in place | <input type="radio"/> | <input type="radio"/> |
| O.2 | GFCI's used | <input type="radio"/> | <input type="radio"/> |
| O.3 | Branch Circuits Labeled | <input type="radio"/> | <input type="radio"/> |
| O.4 | Electric Cord proper rating | <input type="radio"/> | <input type="radio"/> |
| O.5 | Cords protected from traffic | <input type="radio"/> | <input type="radio"/> |
| O.6 | Cords in good condition | <input type="radio"/> | <input type="radio"/> |
| O.7 | Cords have twist lock | <input type="radio"/> | <input type="radio"/> |
| O.8 | Energized parts protected | <input type="radio"/> | <input type="radio"/> |
| O.9 | Proper use temp power boxes | <input type="radio"/> | <input type="radio"/> |
| O.10 | Explosion Proof Fixtures | <input type="radio"/> | <input type="radio"/> |
| O.11 | Signage present-i.e. High Volt | <input type="radio"/> | <input type="radio"/> |
| O.12 | Low Voltage Lighting | <input type="radio"/> | <input type="radio"/> |
| O.13 | Hot Work Permit | <input type="radio"/> | <input type="radio"/> |

| P | MOTORIZED EQUIPMENT | S | U |
|-----|-----------------------------|-----------------------|-----------------------|
| P.1 | Seat belts used | <input type="radio"/> | <input type="radio"/> |
| P.2 | Operator Conducts 360 Check | <input type="radio"/> | <input type="radio"/> |
| P.3 | Operator obeys Speed Limit | <input type="radio"/> | <input type="radio"/> |

| | MOTORIZED EQUIP. (Cont.) | S | U |
|------|--|-----------------------|-----------------------|
| P.4 | Operator Avoids Backing, when possible | <input type="radio"/> | <input type="radio"/> |
| P.5 | Operator Backs First to Park,when possible | <input type="radio"/> | <input type="radio"/> |
| P.6 | Back up alarm functioning | <input type="radio"/> | <input type="radio"/> |
| P.7 | Light, Signals, Horn & Brakes functioning | <input type="radio"/> | <input type="radio"/> |
| P.8 | Windshield free of obstructions | <input type="radio"/> | <input type="radio"/> |
| P.9 | Flagman used if applicable | <input type="radio"/> | <input type="radio"/> |
| P.10 | Air Comp clear-Exhaust Fume Exp | <input type="radio"/> | <input type="radio"/> |
| P.11 | Points of Contact used On/Off Vehicle | <input type="radio"/> | <input type="radio"/> |
| P.12 | EE Reports Vehicle Deficiencies | <input type="radio"/> | <input type="radio"/> |
| O.13 | Trailer properly hitched | <input type="radio"/> | <input type="radio"/> |
| O.14 | Cargo properly secured bed/trailer | <input type="radio"/> | <input type="radio"/> |

| Q | POWER TOOLS - AIR, ELECTRIC & POWDER ACTUATED | S | U |
|------|---|-----------------------|-----------------------|
| Q.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> |
| Q.2 | Information label on tool | <input type="radio"/> | <input type="radio"/> |
| Q.3 | Guard(s) in place | <input type="radio"/> | <input type="radio"/> |
| Q.4 | Mfg. handles in place | <input type="radio"/> | <input type="radio"/> |
| Q.5 | Tool in good condition | <input type="radio"/> | <input type="radio"/> |
| Q.6 | Abrasv wheel in good condition | <input type="radio"/> | <input type="radio"/> |
| Q.7 | Bit/blade - sharp/ good condition | <input type="radio"/> | <input type="radio"/> |
| Q.8 | Elect cords& Equip- current insp | <input type="radio"/> | <input type="radio"/> |
| Q.9 | Operator Licensed | <input type="radio"/> | <input type="radio"/> |
| Q.10 | Air Couplings secure with Pins | <input type="radio"/> | <input type="radio"/> |
| Q.11 | Tool Currently Inspected | <input type="radio"/> | <input type="radio"/> |

| R | HAND TOOLS | S | U |
|-----|-----------------------------|-----------------------|-----------------------|
| R.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> |
| R.2 | Chisel/Hacksaw/Wedge-Cond | <input type="radio"/> | <input type="radio"/> |
| R.3 | Handles (not damaged) | <input type="radio"/> | <input type="radio"/> |
| R.4 | Jaws (not worn or damaged) | <input type="radio"/> | <input type="radio"/> |
| R.5 | Knock Wrench-Best Tech Used | <input type="radio"/> | <input type="radio"/> |
| R.6 | Hands-Out of Line of Fire | <input type="radio"/> | <input type="radio"/> |
| R.7 | Handle/Strap extension used | <input type="radio"/> | <input type="radio"/> |

| S | HOUSEKEEPING | S | U |
|------|-------------------------------------|-----------------------|-----------------------|
| S.1 | Clear access to site | <input type="radio"/> | <input type="radio"/> |
| S.2 | Slip, Trip, Fall Hazards | <input type="radio"/> | <input type="radio"/> |
| S.3 | Tools & Equip stored properly | <input type="radio"/> | <input type="radio"/> |
| S.4 | Materials stored properly | <input type="radio"/> | <input type="radio"/> |
| S.5 | Trash/Debris in prop container | <input type="radio"/> | <input type="radio"/> |
| S.6 | Low clearance areas flag/identified | <input type="radio"/> | <input type="radio"/> |
| S.7 | impalement prot (rebar cap etc) | <input type="radio"/> | <input type="radio"/> |
| S.8 | Roadway around proj clear | <input type="radio"/> | <input type="radio"/> |
| S.9 | Designated Parking | <input type="radio"/> | <input type="radio"/> |
| S.10 | Proper Signage | <input type="radio"/> | <input type="radio"/> |

| T | P.P.E: PER. PROTECT. EQUIP. | S | U |
|------|---------------------------------------|-----------------------|-----------------------|
| T.1 | Hard Hat | <input type="radio"/> | <input type="radio"/> |
| T.2 | Safety Glasses | <input type="radio"/> | <input type="radio"/> |
| T.3 | Approp. Hearing protection | <input type="radio"/> | <input type="radio"/> |
| T.4 | Hi-visibility const vest | <input type="radio"/> | <input type="radio"/> |
| T.5 | Gloves | <input type="radio"/> | <input type="radio"/> |
| T.6 | Work Boots | <input type="radio"/> | <input type="radio"/> |
| T.7 | Metatarsal protection | <input type="radio"/> | <input type="radio"/> |
| T.8 | PPE Stored properly | <input type="radio"/> | <input type="radio"/> |
| T.9 | Respirators proper for task | <input type="radio"/> | <input type="radio"/> |
| T.10 | Respirator cartridges proper for task | <input type="radio"/> | <input type="radio"/> |
| T.11 | Face Shield | <input type="radio"/> | <input type="radio"/> |
| T.12 | Fire Retardant Clothing | <input type="radio"/> | <input type="radio"/> |
| T.13 | SCBA | <input type="radio"/> | <input type="radio"/> |

| U | SITE / PUBLIC PROTECTION | S | U |
|------|---------------------------|-----------------------|-----------------------|
| U.1 | Public protection signage | <input type="radio"/> | <input type="radio"/> |
| U.2 | Perimeter fences | <input type="radio"/> | <input type="radio"/> |
| U.3 | Excavations protected | <input type="radio"/> | <input type="radio"/> |
| U.4 | Falling object protection | <input type="radio"/> | <input type="radio"/> |
| U.5 | Barricades installed prop | <input type="radio"/> | <input type="radio"/> |
| U.6 | Adequate lighting | <input type="radio"/> | <input type="radio"/> |
| U.7 | Street closure identified | <input type="radio"/> | <input type="radio"/> |
| U.8 | Security system in place | <input type="radio"/> | <input type="radio"/> |
| U.9 | Company rep present | <input type="radio"/> | <input type="radio"/> |
| U.10 | Traffic Control plan | <input type="radio"/> | <input type="radio"/> |

| V | ENVIRONMENTAL | S | U |
|-----|-----------------------------|-----------------------|-----------------------|
| V.1 | Asbestos/Lead/Mold/Silica | <input type="radio"/> | <input type="radio"/> |
| V.2 | Concrete cut wet & vacuum | <input type="radio"/> | <input type="radio"/> |
| V.3 | Containers labeled | <input type="radio"/> | <input type="radio"/> |
| V.4 | Hazard material prop stored | <input type="radio"/> | <input type="radio"/> |
| V.5 | Nuisance dust | <input type="radio"/> | <input type="radio"/> |
| V.6 | Spill containment adequate | <input type="radio"/> | <input type="radio"/> |

| W | MISCELLANEOUS | S | U |
|-----|--|-----------------------|-----------------------|
| W.1 | All employees trained on HASP; if applicable | <input type="radio"/> | <input type="radio"/> |
| W.2 | All Subcontractors utilizing subcontractor JSA's | <input type="radio"/> | <input type="radio"/> |
| W.3 | | | |
| W.4 | | | |
| W.5 | | | |
| W.6 | | | |
| W.7 | | | |

FORM ID 10124896

Comments



Comments



Comments



Inspection Date M M D D Y Y

Inspected By (First Name)

Inspected By (Last Name)

Job Number

Site Location

Trade(s)

Description of Work

use ☒ not ☒ not ☒ (S) Safe / (U) Unsafe**A ADMINISTRATION CONTROLS S U**

- A.1 Unit Sign-in & Sign-out ☐ ☐
- A.2 JSA submitted each trade ☐ ☐
- A.3 JSA Quality (Hazard ID & Control) ☐ ☐
- A.4 JSA Quality (Work Description/Loc.) ☐ ☐
- A.5 JSA Quality (Focus on three) ☐ ☐
- A.6 JSA (Employee Sign-off) ☐ ☐
- A.7 JSA (Eye Wash/Shower Loc.) ☐ ☐
- A.8 JSA (Muster Point) ☐ ☐
- A.9 JSA Recertified ☐ ☐
- A.10 High Hazard JSA Completed where Applicable ☐ ☐
- A.11 High Hazard JSA Recertified if one was Applicable ☐ ☐
- A.12 JJW Foreman Certified/Trained ☐ ☐

B MEDICAL/EMERGENCY S U

- B.1 Automatic External Defib (AED) ☐ ☐
- B.2 First Aid Kit ☐ ☐
- B.3 First Aid / CPR available ☐ ☐
- B.4 Eyewash Station(s) ☐ ☐
- B.5 Emer Numbers Posted(hosp etc) ☐ ☐
- B.6 Company Emer Contact Info ☐ ☐
- B.7 JJW Team contact numbers ☐ ☐
- B.8 Map to medical facility(s) ☐ ☐
- B.9 Emergency Action Plan ☐ ☐

C HAZARD COMMUNICATIONS S U

- C.1 Readily available ☐ ☐
- C.2 Inventory List (MSDS) ☐ ☐
- C.3 Proper labels on containers ☐ ☐
- C.4 Employees trained ☐ ☐

D PERMITS S U

- D.1 Hot Work ☐ ☐
- D.2 Confined Space ☐ ☐
- D.3 Vehicle Entry ☐ ☐
- D.4 Roadway (for blocking) ☐ ☐
- D.5 Critical Lift ☐ ☐
- D.6 Fire Hydrant (water usage) ☐ ☐
- D.7 Cold Work ☐ ☐

E CRANES & HOISTING EQUIP. S U

- E.1 Proper Distance power lines/de-ener ☐ ☐
- E.2 Crane supported and level ☐ ☐
- E.3 Outtrigger extend/mats in place ☐ ☐
- E.4 Anti Two Block device ☐ ☐
- E.5 Swing radius barricaded ☐ ☐
- E.6 Signal Person Identified & Trained ☐ ☐
- E.7 Loads properly secured ☐ ☐
- E.8 Weight of load verified ☐ ☐
- E.9 Rigging rated for proper Capacity ☐ ☐
- E.10 Slings Condition (Worn/Frayed/Label) ☐ ☐
- E.11 Tag line(s) used ☐ ☐
- E.12 Hands clear of the load ☐ ☐
- E.13 Cert or verify training ☐ ☐
- E.14 Proper use of "CAZ" id ☐ ☐
- E.15 Rigging Inspected ☐ ☐
- E.16 Critical Lift Plan Completed if Applicable ☐ ☐

F CONFINED SPACE S U

- F.1 Is permit required? ☐ ☐
- F.2 "Confined space" sign at entry ☐ ☐
- F.3 "Standby" person at entry ☐ ☐
- F.4 Prop barricaded if not in use ☐ ☐
- F.5 Atmospheric conditions ☐ ☐
- F.6 Atmos monitor equip in place ☐ ☐
- F.7 Confined Space Training ☐ ☐
- F.8 Sign-in/out log at the entry ☐ ☐
- F.9 Sign-in/out log accurate ☐ ☐
- F.10 Rescue plan/emerg #s/map ☐ ☐

G SCAFFOLDS S U

- G.1 Surface in safe condition ☐ ☐
- G.2 Wood/metal lanks in safe condition ☐ ☐
- G.3 Sills, plates, jacks installed & secured ☐ ☐
- G.4 Guardrails in place @ 6 ☐ ☐
- G.5 Bracing and pins in place ☐ ☐
- G.6 Proper access to platforms ☐ ☐
- G.7 Overhead clearance on ladders (24") ☐ ☐
- G.8 Properly secured to structure ☐ ☐
- G.9 Proper loading of materials ☐ ☐
- G.10 Deck is free of trash & debris ☐ ☐
- G.11 Compatible components used ☐ ☐
- G.12 Safe work distances ☐ ☐
- G.13 Inspected daily ☐ ☐
- G.14 Competent person present ☐ ☐

H LADDERS / STAIRS S U

- H.1 Proper use of ladder ☐ ☐
- H.2 Straight Ladder tied off ☐ ☐
- H.3 Extension ladder 4:1 pitch ☐ ☐
- H.4 Ladder ext 3' above landing ☐ ☐
- H.5 Clear of debris/materials ☐ ☐
- H.6 Safe work dist from hazards ☐ ☐
- H.7 Properly guarded in roadways ☐ ☐
- H.8 Inspected for defects ☐ ☐
- H.9 Rails at stairs/landings ☐ ☐
- H.10 Slip trip exposure elim ☐ ☐
- H.11 Stairs illuminated ☐ ☐
- H.12 Access break >19" ☐ ☐
- H.13 Step ladders >6' tied off ☐ ☐
- H.14 Step ladders-Spreaders locked ☐ ☐
- H.15 EE uses 3 points of contact ☐ ☐
- H.16 Confirm no conflicting work above/below ☐ ☐

I RESPIRATORY PROTECTION S U

- I.1 Employee(s): Clean Shaven ☐ ☐
- I.2 Employee(s): Medically Cleared ☐ ☐
- I.3 Employee(s): Trained & Fit Test ☐ ☐
- I.4 Resp. stored properly ☐ ☐

RESPIRATORY PROT. (Cont.) S U

- I.5 Correct type for the hazard ☐ ☐
- I.6 Proper cartridge ☐ ☐
- I.7 Fresh Air Zone Setup ☐ ☐
- I.8 FA- Bottlewatch present ☐ ☐
- I.9 FA- Bottles outside barricade ☐ ☐
- I.10 FA- Bottle watch has horn ☐ ☐
- I.11 FA- Gauges/Bell in good condition ☐ ☐
- I.12 FA- Safety Standby present ☐ ☐
- I.13 Safety trained in First Aid/CPR ☐ ☐
- I.14 FA- Separate bottles for Safety ☐ ☐
- I.15 FA- Radio to summon emer services ☐ ☐
- I.16 FA- <300' of air line each person ☐ ☐
- I.17 FA- 2 egress points avail. ☐ ☐

J FALL PROTECTION S U

- J.1 Fall protection at 6' ☐ ☐
- J.2 Anch Points Proper Capacity ☐ ☐
- J.3 Fall Prot effect-will Arrest fall ☐ ☐
- J.4 Body Harness worn Properly ☐ ☐
- J.5 Equipment Inspected ☐ ☐
- J.6 Ext guardrail(roof/floor/edge) ☐ ☐
- J.7 Int guardrail (wall/floor open) ☐ ☐
- J.8 Stair/Ramp/walkway protected ☐ ☐
- J.9 Floor cover adeq/secure/label ☐ ☐
- J.10 Fall Protection Plan ☐ ☐

K FIRE PROTECTION S U

- K.1 Fire suppression equip avail ☐ ☐
- K.2 Fire Ext-Monthly & Annual Insp ☐ ☐
- K.3 Prop signs in store areas ☐ ☐
- K.4 Emergency vehicle access ☐ ☐
- K.5 Air Monitor-Hot Work<10%LEL ☐ ☐
- K.6 Fire Watch in place when req ☐ ☐

L WELDING / CUTTING S U

- L.1 Gas Cylinders stored properly ☐ ☐
- L.2 Gauges & Torch in good condition ☐ ☐
- L.3 Flash Arrest on Burn/Cut torch ☐ ☐
- L.4 Weld Screen(s)-Where Required ☐ ☐
- L.5 Comb/Fiam're away frm weld ops ☐ ☐
- L.6 Ankle strap/ bib for pos weld ☐ ☐
- L.7 Leads in good condition ☐ ☐
- L.8 Welding Machin Ventilated ☐ ☐
- L.9 Gauges working properly ☐ ☐
- L.10 Fire Blanket in place when required ☐ ☐

FORM ID 10125007

| M | MOTORIZED EQUIPMENT | S | U |
|------|--|-----------------------|-----------------------|
| M.1 | Seat belts used | <input type="radio"/> | <input type="radio"/> |
| M.2 | Operator Conducts 360 Check | <input type="radio"/> | <input type="radio"/> |
| M.3 | Operator obeys Speed Limit | <input type="radio"/> | <input type="radio"/> |
| M.4 | Operator Avoids Backing, when possible | <input type="radio"/> | <input type="radio"/> |
| M.5 | Operator Backs First to Park,when possible | <input type="radio"/> | <input type="radio"/> |
| M.6 | Back up alarm functioning | <input type="radio"/> | <input type="radio"/> |
| M.7 | Light, Signals, Horn&Brakes functioning | <input type="radio"/> | <input type="radio"/> |
| M.8 | Windshield free of obstructions | <input type="radio"/> | <input type="radio"/> |
| M.9 | Flagman used if applicable | <input type="radio"/> | <input type="radio"/> |
| M.10 | Air Comp clear-Exhaust Fume Exp | <input type="radio"/> | <input type="radio"/> |
| M.11 | 3 Points of Contact used On/Off Vehicle | <input type="radio"/> | <input type="radio"/> |
| M.12 | EE Reports Vehicle Deficiencies | <input type="radio"/> | <input type="radio"/> |
| M.13 | Trailer properly hitched | <input type="radio"/> | <input type="radio"/> |
| M.14 | Cargo properly secured bed/trailer | <input type="radio"/> | <input type="radio"/> |
| N | POWER TOOLS - AIR, ELECTRIC & POWDER ACTUATED | S | U |
| N.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> |
| N.2 | Information label on tool | <input type="radio"/> | <input type="radio"/> |
| N.3 | Guard(s) in place | <input type="radio"/> | <input type="radio"/> |
| N.4 | Mfg. handles in place | <input type="radio"/> | <input type="radio"/> |
| N.5 | Tool in good condition | <input type="radio"/> | <input type="radio"/> |
| N.6 | Abrasv wheel in good condition | <input type="radio"/> | <input type="radio"/> |
| N.7 | Bit/blade - sharp/ good condition | <input type="radio"/> | <input type="radio"/> |
| N.8 | Elect cords& Equip- current insp | <input type="radio"/> | <input type="radio"/> |
| N.9 | Operator Licensed | <input type="radio"/> | <input type="radio"/> |
| N.10 | Air Couplings secure with Pins | <input type="radio"/> | <input type="radio"/> |
| N.11 | Tool Currently Inspected | <input type="radio"/> | <input type="radio"/> |
| O | HOUSEKEEPING | S | U |
| O.1 | Clear access to site | <input type="radio"/> | <input type="radio"/> |
| O.2 | Slip, Trip, Fall Hazards | <input type="radio"/> | <input type="radio"/> |
| O.3 | Tools & Equip stored properly | <input type="radio"/> | <input type="radio"/> |
| O.4 | Materials stored properly | <input type="radio"/> | <input type="radio"/> |
| O.5 | Trash/Debris in prop container | <input type="radio"/> | <input type="radio"/> |
| O.6 | Low clearance areas flag/identified | <input type="radio"/> | <input type="radio"/> |
| O.7 | Impalement prot (rebar cap etc) | <input type="radio"/> | <input type="radio"/> |
| O.8 | Roadway around proj clear | <input type="radio"/> | <input type="radio"/> |
| O.9 | Designated Parking | <input type="radio"/> | <input type="radio"/> |
| O.10 | Proper Signage | <input type="radio"/> | <input type="radio"/> |

| P | HAND TOOLS | S | U |
|-----|-----------------------------|-----------------------|-----------------------|
| P.1 | Proper tool for the job | <input type="radio"/> | <input type="radio"/> |
| P.2 | Chisel/Hacksaw/Wedge-Cond | <input type="radio"/> | <input type="radio"/> |
| P.3 | Handles (not damaged) | <input type="radio"/> | <input type="radio"/> |
| P.4 | Jaws (not worn or damaged) | <input type="radio"/> | <input type="radio"/> |
| P.5 | Knock Wrench-Best Tech Used | <input type="radio"/> | <input type="radio"/> |
| P.6 | Hands-Out of Line of Fire | <input type="radio"/> | <input type="radio"/> |
| P.7 | Handle/Strap extension used | <input type="radio"/> | <input type="radio"/> |

| Q | ENVIRONMENTAL | S | U |
|-----|-----------------------------|-----------------------|-----------------------|
| Q.1 | Asbestos/Lead/Mold/Silica | <input type="radio"/> | <input type="radio"/> |
| Q.2 | Concrete cut wet & vacuumed | <input type="radio"/> | <input type="radio"/> |
| Q.3 | Containers labeled | <input type="radio"/> | <input type="radio"/> |
| Q.4 | Hazard material prop stored | <input type="radio"/> | <input type="radio"/> |
| Q.5 | Nuisance dust | <input type="radio"/> | <input type="radio"/> |
| Q.6 | Spill containment adequate | <input type="radio"/> | <input type="radio"/> |

| R | HIGH PRESSURE WATER WASH | S | U |
|------|--|-----------------------|-----------------------|
| R.1 | Barricades/Signs-in place & Effective | <input type="radio"/> | <input type="radio"/> |
| R.2 | PPE-per Permit & JJW Training requirements | <input type="radio"/> | <input type="radio"/> |
| R.3 | Respiratory Prot as required | <input type="radio"/> | <input type="radio"/> |
| R.4 | HPWW JJW Safety Checklist used | <input type="radio"/> | <input type="radio"/> |
| R.5 | All Safety Mtgs accomplished per Training | <input type="radio"/> | <input type="radio"/> |
| R.6 | Communication-OE/Foot Pedal/Nozzle | <input type="radio"/> | <input type="radio"/> |
| R.7 | HP Hose connection whip-checks | <input type="radio"/> | <input type="radio"/> |
| R.8 | Foot pedal -guard in Place | <input type="radio"/> | <input type="radio"/> |
| R.9 | Moleing-Anti-withdrawal device | <input type="radio"/> | <input type="radio"/> |
| R.10 | EE HPWW JJW Trained | <input type="radio"/> | <input type="radio"/> |
| R.11 | EE HPWW Important Medical Info Card | <input type="radio"/> | <input type="radio"/> |

| S | P.P.E: PERSONAL PROTECTIVE EQUIPMENT | S | U |
|-----|---|-----------------------|-----------------------|
| S.1 | Hard Hat | <input type="radio"/> | <input type="radio"/> |
| S.2 | Monogoggles | <input type="radio"/> | <input type="radio"/> |
| S.3 | Safety Glasses | <input type="radio"/> | <input type="radio"/> |
| S.4 | Glasses / face shields | <input type="radio"/> | <input type="radio"/> |
| S.5 | Approp. Hearing protection | <input type="radio"/> | <input type="radio"/> |

| P.P.E: PERSONAL PROTECTIVE EQUIP. (Cont.) | | S | U |
|--|---------------------------------------|-----------------------|-----------------------|
| S.6 | Personal Monitors(H2S,O2 etc) | <input type="radio"/> | <input type="radio"/> |
| S.7 | Nomex | <input type="radio"/> | <input type="radio"/> |
| S.8 | Req Chemical Clothing worn | <input type="radio"/> | <input type="radio"/> |
| S.9 | Hi-visibility const vest | <input type="radio"/> | <input type="radio"/> |
| S.10 | Gloves | <input type="radio"/> | <input type="radio"/> |
| S.11 | Sleeve roll down zip secure | <input type="radio"/> | <input type="radio"/> |
| S.12 | Work Boots | <input type="radio"/> | <input type="radio"/> |
| S.13 | Metatarsal protection | <input type="radio"/> | <input type="radio"/> |
| S.14 | PPE Stored properly | <input type="radio"/> | <input type="radio"/> |
| S.15 | Respirators proper for task | <input type="radio"/> | <input type="radio"/> |
| S.16 | Respirator cartridges proper for task | <input type="radio"/> | <input type="radio"/> |
| S.17 | Face Shield | <input type="radio"/> | <input type="radio"/> |
| S.18 | Fire Retardant Clothing | <input type="radio"/> | <input type="radio"/> |
| S.19 | SCBA | <input type="radio"/> | <input type="radio"/> |

| T | SITE / PUBLIC PROTECTION | S | U |
|------|---------------------------|-----------------------|-----------------------|
| T.1 | Public protection signage | <input type="radio"/> | <input type="radio"/> |
| T.2 | Perimeter fences | <input type="radio"/> | <input type="radio"/> |
| T.3 | Excavations protected | <input type="radio"/> | <input type="radio"/> |
| T.4 | Falling object protection | <input type="radio"/> | <input type="radio"/> |
| T.5 | Barricades installed prop | <input type="radio"/> | <input type="radio"/> |
| T.6 | Adequate lighting | <input type="radio"/> | <input type="radio"/> |
| T.7 | Street closure identified | <input type="radio"/> | <input type="radio"/> |
| T.8 | Security system in place | <input type="radio"/> | <input type="radio"/> |
| T.9 | Company rep present | <input type="radio"/> | <input type="radio"/> |
| T.10 | Traffic Control plan | <input type="radio"/> | <input type="radio"/> |

| U | MISCELLANEOUS | S | U |
|-----|---|-----------------------|-----------------------|
| U.1 | All employees trained on HASP; if applicable | <input type="radio"/> | <input type="radio"/> |
| U.2 | All Subcontractors utilizing subcontractor JSA's | <input type="radio"/> | <input type="radio"/> |
| U.3 | | | |
| U.4 | | | |
| U.5 | | | |
| U.6 | | | |
| U.7 | | | |

Comments



FORM ID 10125007

Comments



Comments



APPENDIX 6
RESPIRATOR PROGRAM



J. J. White, Inc.

Respiratory Protection Program

I. PURPOSE AND SCOPE

This program provides procedures for managing a respiratory protection program at J. J. White, Inc. job sites. The program is based on the requirements of the Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.134 titled “Respiratory Protection”.

II. POLICY

In the control of air contaminants at J. J. White, Inc. job sites, the primary objective is to prevent atmospheric contamination. This objective is attempted as far as feasible by accepted engineering and/or administrative control measures. If engineering/administrative controls are not feasible, appropriate respiratory protection must be utilized pursuant to the following procedures.

The J. J. White respirator program includes elements for the evaluation and control of air contaminants, respirator training and fit-testing, procedures for cleaning, maintaining, inspecting and storing respirators, medical evaluation and clearance, and periodic respirator program audits.

III. RESPONSIBILITY

The Corporate Safety Coordinator is responsible for keeping the Respiratory Protection Program current, auditing the job site to evaluate the effectiveness of the respirator program, and shall be the program administrator.

The Job Superintendent, with the direct assistance from a Safety Coordinator, shall create an “Exposure Assessment Record” for each and every job site where respirators are required to be worn, and is responsible for determining where and when employees should wear respirators (information obtained at the pre-job meetings), ensuring that employees are medically cleared, fit-tested and properly trained to wear respirators, and enforcing the appropriate use of respirators at the job site.

The Job Foreman is responsible for strictly enforcing the respirator use requirements with their individual men, and immediately reporting to the superintendent any safety concerns regarding the use of respirators at the job site.

Employees authorized to wear respirators are responsible for reading and observing all J. J. White, Inc. and Owner safety rules and regulations regarding respirators.

IV. PROCEDURES

A. Exposure Identification, Evaluation and Control:

1. The job superintendent and a safety coordinator will determine potential employee exposures to airborne chemicals at the job site. This information will generally be collected and evaluated in consultation with the Owner Representative at the pre-job meeting using the Exposure Assessment Record Form.
2. The job superintendent and the safety coordinator will review potential engineering controls or work practice controls with the Owner Representative, and attempt to use such controls in lieu of respirators. If engineering and/ or administrative controls are not feasible, recommendations for respiratory protection will be communicated to all employees at the job site.

B. Selection and Use of Respiratory Protection

1. The job superintendent or safety manager will recommend the appropriate respiratory protection based on current OSHA recommendations and use of the Exposure Assessment Record (refer to attachment G).
2. Employees will be medically cleared and fit-tested to wear tight fitting respirators prior to actually wearing a respirator at the job site. Fit tests will be performed annually thereafter.
3. Authorized employees (defined as employees who have been medically cleared, and properly trained and fit-tested) must wear the recommended respirator in accordance with the “Standard Procedures for Utilization of Respiratory Protection” (refer to Attachment A).
4. The required use of Supplied Air Respirators (SAR’s) at any job site implies that the airborne concentration of contaminants is, or has the potential to be, Immediately Dangerous to Life and Health (IDLH).
5. It is the policy of J. J. White, Incorporated to require the use of 5 minute emergency escape packs whenever and wherever SARs are required to perform a task, i.e. installing or removing “fresh air” blinds in pipe lines; entry into any

inert gas vessel. Additionally, the use of a qualified fresh air stand-by is also required.

C. Employee Education, Training, and Fit-Testing:

1. Initial, and annual refresher, training (refer to Attachment B) must be conducted by the job superintendent or a safety coordinator prior to any employee being issued a respirator.
2. Initial fit testing (refer to Attachment C) must be conducted prior to any employee being issued a respirator. Fit testing must be repeated annually or when an employee experiences significant facial feature changes caused by body weight change, dental work or other surgery, etc.
3. A Quantitative Fit Test (QNFT) must now be used for all respirators being used.
4. Cleaning, Inspection, Repair and Storage of Respirators:
 - a. Re-usable respirators must be cleaned and disinfected as outlined in Attachment D.
 - b. Each respirator must be inspected during cleaning and before and after each use as outlined in Attachment E.
 - c. Respirator parts identified as questionable during inspection must be replaced.
 - d. Valves or regulators on air-supplied respirators must be returned to the manufacturer or respirator representative for adjustment or repair.
 - e. Respirators must be stored in sealed plastic bags in a sanitary location protected against dust, sunlight, extreme temperatures, moisture, or damaging chemicals. They must be stored so that the valves and pliable parts rest in their normal position.
5. Program Evaluation:
 - a. The job foreman and superintendent must conduct random audits of employee compliance with the “Standard Procedures for Utilization of Respiratory Protection” (Attachment A), the “Procedures for Cleaning and Disinfecting” (Attachment D), and the “Respirator Inspection Procedures” (Attachment E).
 - b. The corporate safety coordinator will provide periodic audits of the respiratory protection program in selected work areas using a checklist such as the “Respirator Program Evaluation Checklist” (Attachment F).

ATTACHMENT A

STANDARD PROCEDURES FOR UTILIZING RESPIRATORY PROTECTION

1. The job superintendent, in consultation with a safety coordinator and the Owner representative, must select respirators. All respirators will be selected in accordance with current OSHA recommendations.
2. Each job site's Exposure Assessment Record must clearly specify the appropriate respirator type and the circumstances requiring when and where respirators must be worn.
3. Each authorized respirator user must be medically cleared, fit-tested, and properly educated and trained in the use of respiratory protection, before being issued a respirator. Employees with facial hair at the respirator seal will not pass fit-testing for a negative pressure respirator and, per OSHA requirements, they will be required to shave.
4. Whenever possible, reusable respiratory protection will be issued for individual use. Disposable respirators may be issued to authorized employees as needed but must be discarded after each use or the end of the shift. See paragraph 13 of Attachment A.
5. To assure proper protection, a positive or negative pressure used seal check should be performed prior to each use of any tight fitting respirator.
6. Cartridge Change Over Schedule defines the following criteria, which shall be used to determine when an air purifying respirator cartridge change shall occur. The cartridges shall be changed when:
 - a. As soon as a noticeable increase in breathing resistance is sensed; i.e. causing distress or discomfort to the wearer.
 - b. As soon as containment breakthrough is sensed, i.e. taste or smell of containment.
 - c. If the cartridge is damage or soiled.
 - d. At the end of each shift that the cartridge was removed from its packaging.
7. Reusable respirators used by more than one worker must be thoroughly cleaned and disinfected after each use. Respirators assigned to one worker must be cleaned and disinfected as needed to ensure cleanliness.
8. Each respirator must be inspected before and after use and cleaning. The inspection must include a check of the tightness of all connections and the condition of the face piece, headbands, valves, filter holder or connecting tube and filters. Damaged or questionable items must be immediately discarded or replaced.

Respiratory Protection Program – J.J. White, Inc.

9. Respirators must be stored in plastic storage bags or resealable containers, in compartments that afford protection from dust, sunlight, extreme temperatures, excessive moisture, or damaging chemicals. Care must be taken to ensure that the respirators are positioned so that the face piece and exhalation valve rest in a normal position.
10. A safety coordinator, to ensure that respirators are properly selected, used, cleaned and maintained, will perform frequent, random inspections.
11. If used, Self-Contained Breathing Apparatus (SCBA) must be inspected each month, and must be readily accessible and stored in highly visible compartments.
12. Only bottled “Grade D” breathing air can be used for SCBAs and airline masks. No other sources are acceptable. The job superintendent must request a “Certificate of Analysis” from the supplier evidencing the bottled air meets the requirements of “Grade D” breathing air.
13. Those employees utilizing respirators on a voluntary use must read attachment H. Persons choosing to wear a respirator voluntarily (that is not required as part of the job) must still undergo a pulmonary function test, fit test, and training on how to clean and store the respirator so it does not present a health hazard to the user. Exception to this rule is for an individual voluntarily wearing disposable filtering face piece (Dust Mask) type respirators do not need medical clearance, fit testing or training. However, they must follow the manufacturer’s written instructions for proper use. In all cases where respirator use is voluntary, the atmospheric level of all contaminants must be below OSHA’s Permissible Exposure Limit (PEL) for those contaminants.

ATTACHMENT B

RESPIRATOR TRAINING OUTLINE

1. Initial employee respirator training must include the following topics, at a minimum:
2. Instruction in the nature of chemical hazards and a review of the toxic effects of the chemical, if proper respiratory protection is not worn.
3. Discussion of the engineering and administrative controls in use, and why respirators are needed.
4. Review of why the specific type of respirator was selected, and when and where to use the respirator.
5. Discussion of the limitations of the respirator and how to recognize and react to emergency situations.
6. Explanation and hands-on review of the proper procedures for donning, adjusting, user seal checks and inspecting the respirator.
7. Instructions in methods to clean, disinfect, maintain and store the respirator properly.
8. Each employee should then don the respirator, fit it properly and check the fit with a positive and negative pressure user seal check and have it qualitatively fit-tested.
9. Respirator training program records are maintained for at least 30 years.
10. M.S.A. or Scott* brand respirators are the only tight fitting respirators permitted for use by J. J. White, Incorporated employees.

* Limited to Paulsboro Refinery SAR – any other site will require approval from corporate Risk Management and Safety Department.
11. Follow the manufacturer's chart for proper cartridge selection for hazard encountered. (Attachment J).
12. In all instances where these cartridges are not appropriate for the contaminants encountered, a J. J. White, Inc. Safety Coordinator must be contacted for guidance in the selection of the proper cartridge.

ATTACHMENT C

PRE – USE RESPIRATOR SELECTION & INSPECTION

1. Respirator Selection:

Prior to any fit test, a competent individual shall determine the appropriate respirator and cartridge combination. A competent person shall be one who is familiar with the hazards being protected against and the Respirator Selection Protocol and is the site Superintendent or Safety Coordinator.

2. Preliminary Training and Instruction:

Prior to any fit test, all individuals and supervision shall be made to understand the proper use, application, fitting procedures, care, and limitations of the intended respirator.

3. Pre- Use Inspection per Attachment E .

4. Positive and Negative Pressure User Seal Check:

Once the respirator has been donned, a conventional positive/negative user seal check shall be performed as follows:

- a. While holding a hand on exhalation valve and forming a seal, subject shall exhale slightly. No leakage around face shield should be noted.
- b. While holding both hands over inhalation cartridges and forming a seal, subject shall inhale. Again, no leakage shall be detected around face seal.

Note 1: If leakage is detected in either or both positive and negative checks, that respirator shall be rejected for that individual and another size or style selected.

Note 2: This section (item (c).) of the Fit-Test Procedure may be used for cartridge type and SCBA respirators, provided SCBA type has provision for removal of regulator from face piece and installation of a cartridge face type adapter in its place, or a hose that normally attaches to the hip mounted regulator.

ATTACHMENT D

RESPIRATOR CLEANING AND DISINFECTION PROCEDURES

OSHA Appendix B-2 to § 1910.134: Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B- 2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

I. Procedures for Cleaning Respirators

- A. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure- demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- B. Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- C. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.
- D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
 - 1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,
 - 2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,
 - 3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

OSHA Appendix B-2 to § 1910.134: Respirator Cleaning Procedures (Mandatory) cont'd.

- E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- F. Components should be hand-dried with a clean lint-free cloth or air-dried.
- G. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
- H. Test the respirator to ensure that all components work properly.

[63 FR 1152, Jan. 8, 1998]

ATTACHMENT E

RESPIRATOR INSPECTION PROCEDURES

- I. Air Purifying Respirators:
 - A. Face-Piece:
 - 1. Excessive dirt
 - 2. Cracks, tears, holes or distortion from improper storage
 - 3. Cracked or scratched lenses (full face)
 - 4. Incorrectly mounted full-face piece lens or broken or missing mounting clips
 - 5. Cracked or broken air purifying element holder(s), badly worn threads, or missing gasket(s)
 - B. Head Straps or Harness:
 - 1. Loss of elasticity
 - 2. Broken or malfunctioning buckles and attachments
 - 3. Excessively worn serrations on the head harness which may permit slippage
 - C. Exhalation Valve:
 - 1. Foreign material
 - 2. Cracks, tears or distortion of valve material
 - 3. Missing or defective valve cover
 - 4. Improper installation of the valve in the valve body
 - D. Air Purifying Element:
 - 1. Correct cartridge, canister or filter.
 - 2. Incorrect installation, loose connections, missing or worn gaskets, or cross-threading in holder.
 - 3. Expired shelf-life date on cartridge or canister
 - 4. Cracks or dents in outside cases of filter cartridge or canister

II. Disposable Respirators (Filtering Face Pieces)

A. Entire Respirator:

1. Tears, holes, defects
2. Dirt or evidence that the respirator was used previously

III. Air Supplied Respirators:

A. Tight-Fitting Face Piece – follow the procedure outlined above for air-purifying respirators except those pertaining to the air-purifying element.

B. Hood, Helmet, Blouse, or Full Suit- examine:

1. Hood, blouse or full suit for rips and tears, seam integrity etc.
2. Protective headgear with emphasis on suspension inside the headgear
3. Protective faceshields, if any, for cracks or breaks or impaired vision due to rebounding abrasive particles
4. The protective screen to be sure that it is intact and secured correctly over the faceshields of abrasive blasting hoods and blouses

C. Air Supply System:

1. Integrity and good condition of air supply lines and hoses, including attachments and end fittings.
2. Correct operation and condition of all regulators, valves, or other air flow regulators.

ATTACHMENT F

RESPIRATOR PROGRAM EVALUATION CHECKLIST

1. Engineering and/or administrative controls have been implemented, when feasible, to alleviate the need for respirators.
2. Clear instructions have been communicated to employees regarding when and where respirators are required.
3. Respirators are selected on the basis of the hazards to which employees are potentially exposed.
4. A competent person has selected the respirators to be utilized.
5. Only approved respirators have been selected which provide adequate protection for the specific hazard and concentration of the contaminant.
6. Employees have been medically cleared prior to wearing respirators at the job site.
7. Employees have been adequately trained and fit-tested prior to wearing respirators at the job site.
8. Re-usable respirators are cleaned and disinfected after each use, or as frequently as necessary, to maintain good hygiene.
9. Respirators are inspected during cleaning, and before and after each use.
10. Respirator parts identified as questionable during inspection are replaced.
11. Cartridges are replaced at the end of each shift, at a minimum or via the manufacturer's recommendation.
12. Respirators are stored in sealed plastic bags in a sanitary location protected against dust, sunlight, extreme temperatures, moisture, or damaging chemicals.
13. Respirators are stored so that the valves and pliable parts rest in their normal position.
14. Emergency-use, Self-Contained Breathing Apparatus (SCBA), are inspected at least monthly and prior to each use.
15. Records of respirator training, fit testing, and audits are in good order and available for inspection.
16. A copy of the Respiratory Protection Program is available at the job site.

ATTACHMENT G

EXPOSURE ASSESSMENT RECORD

| | | | |
|--|--|-------------|----------------------|
| EXPOSURE ASSESSMENT RECORD | | | |
| Respiratory Protection Program Administrator: | | | |
| Job Number: | | Date: | |
| Job Name and Location: | | | |
| Job Description: () Routine () Emergency | | | |
| Describe work to be performed and length of time involved: | | | |
| CONTAMINANTS | | | |
| Concentration: (Measured or Estimated) | Reference: (Report #, Survey #, Sample #) | OEL* | Hazard Ratio* |
| | | | |
| | | | |
| | | | |
| | | | |

*OEL - Occupational Exposure Limit: PEL, TLV, STEL, or other company-specified occupational exposure limit.

** Hazard Ratio – Is the quotient of the measured or estimated concentration divided by the appropriate occupational exposure limit. Respirator protection is required if this value is greater than one and all feasible engineering and work practice controls have been implemented to reduce the concentration to as low as possible.

ATTACHMENT H

INFORMATION FOR VOLUNTARY USE OF RESPIRATORY PROTECTION EQUIPMENT WHEN CONTAMINANTS ARE BELOW OSHA PERMISSIBLE EXPOSURE LIMITS (PELS) OSHA APPENDIX “D”

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limit set by OSHA standards.

If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator’s limitations.
2. Choose respirators certified for use to protect against the contaminant of concern.

NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.

3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else’s respirator.

ATTACHMENT I

PULMONARY FUNCTION TESTING, RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

AND QLFT/QNFT TESTING

J.J. White Incorporated does not perform Pulmonary Function Testing, administer a Respirator Medical Evaluation Questionnaire, or perform Fit Testing (either QLFT or QNFT) on our employees.

It has been and continues to be the policy of J. J. White, Incorporated to retain the services of a company that provides a “Physician or Other Licensed Health Care Professional” (PLHCP), to perform all of the aforementioned services and provide a Physician’s written opinion for each individual tested.

Examples of these companies include:

Tek Solv

130 Executive Dr.
Suite 5
Newark, DE 19702
(302) 738 – 1050

Total Safety

20 McDonald Blvd.
Suite 100
Aston, PA 19014
(866) 375 - 0200

The following criteria shall be utilized for the selection of a PLHCP Company:

1. Adherence to a 29 CFR 1910.134; Appendix “A” Fit Testing (1998).
2. Use of the Questionnaire found in 29 CFR 1910.134 Appendix “C” (refer to Attachment K).
3. Use of appropriate spirometry and qualified personnel to administer a Pulmonary Function Test.
4. The PLHCP Company must issue a “Physician’s Written Opinion” for each individual tested. The Physician’s Written Opinion should also include a copy of the questionnaire completed by each individual.

ATTACHMENT J

MANUFACTURER'S CHART FOR CARTRIDGE SELECTION

ATTACHMENT K

OSHA INFOSHEET



For Ordering Information
Call 1-800-MSA-2222

42 CFR Part 84 Compliant

RESPIRATOR CARTRIDGES



RESPIRATORY HAZARDS

| MSA Cartridge Designation | Ultra-Twin / Ultra Elite Comfo / Part No. | Advantage 1000 and 3000 Advantage 200 / Part No. | Color Coding | OV Organic Vapor | CL Chlorine | SD Sulfur Dioxide | CD Chlorine Dioxide | HC Hydrogen Chloride | HS* Hydrogen Sulfide | AM Ammonia | MA Methylamine | FM Formaldehyde | HF Hydrogen Fluoride | MV Mercury Vapor | P100 | R95 | N95 | P95 | See Notes Below |
|--|--|--|-----------------|------------------------|----------------|-------------------------|---------------------------|----------------------------|----------------------------|---------------|-------------------|--------------------|----------------------------|------------------------|------|-----|-----|-----|-----------------------|
| GMA (OV) | 464031 No. in pkg. 10 | 815355 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,3,5 |
| GMA P100 | 815178 No. in pkg. 6 | 815362 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,3,4,5 |
| GMA P100 ShortStack † | 815186 No. in pkg. 6 | — | | | | | | | | | | | | | | | | | 2,3,4,5 |
| GMB (AG) | 464032 No. in pkg. 10 | 815356 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2 |
| GMB P100 | 815179 No. in pkg. 6 | 815363 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,4 |
| GMC (OV/AG) | 464046 No. in pkg. 10 | 815357 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,3,5 |
| GMC P100 | 815180 No. in pkg. 6 | 815364 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,3,4,5 |
| GMC P100 ShortStack † | 815188 No. in pkg. 6 | — | | | | | | | | | | | | | | | | | 2,3,4,5 |
| GMD | 464033 No. in pkg. 10 | 815358 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,3 |
| GMD P100 | 815181 No. in pkg. 6 | 815365 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,3,4 |
| GME (Multigas) | 492790 No. in pkg. 10 | 815359 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,3,5 |
| GME P100 | 815182 No. in pkg. 6 | 815366 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,3,4,5 |
| GMI P100 | 815184 No. in pkg. 6 | 815641 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,3,4,5 |
| Mersorb* | 466204 No. in pkg. 10 | 815361 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,4 |
| Mersorb P100 | 815185 No. in pkg. 6 | 815368 No. in pkg. 2 | | | | | | | | | | | | | | | | | 2,4 |
| P100 | 815175 No. in pkg. 10 | — | | | | | | | | | | | | | | | | | 1,4 |
| Sparkfoe® P100 | 815176 No. in pkg. 10 | — | | | | | | | | | | | | | | | | | 1,4 |
| Low Profile P100 | 815177 No. in pkg. 10 | 815369 No. in pkg. 2 | | | | | | | | | | | | | | | | | 1,4 |
| Stand-alone & Cover <small>(N95 and covers required for Comfo Respirators)</small> | 816602 N95 up to 10 816601 N95 up to 20 800252 Reusable snap-on cover No. in pkg. 1,2 (req.) | 818346 N95 Stand-alone Flexi-Filter No. in pkg. 2 | | | | | | | | | | | | | | | | | 1 |
| Prefilter & Cover | 816602 N95 up to 10 816601 N95 up to 20 800252 Reusable snap-on cover No. in pkg. 1,2 (req.) | 818346 N95 up to 10 818347 N95 up to 20 818348 Reusable snap-on cover No. in pkg. 2,3 (req.) | | | | | | | | | | | | | | | | | 1 |
| Prefilter & Cover | 818347 R95 up to 20 818348 R95 Reusable snap-on cover No. in pkg. 2,3 (req.) | 818349 R95 Reusable snap-on cover No. in pkg. 2,3 (req.) | | | | | | | | | | | | | | | | | 1 |
| Flexi-Filter Pads* for Advantage® Respirators | 818342 818343 818344 | Flexi-Filter P100 Flexi-Filter P100 with Nuisance Level OV, Ozone Removal Flexi-Filter P100 with Nuisance Level AG, HF Removal | | | | | | | | | | | | | | | | | 1,4 |
| Flexi-Filter Pads* for Advantage® Respirators | 818354 818355 1083227 | Flexi-Filter P95 Flexi-Filter P95 with Nuisance Level OV Removal Flexi-Filter P95, NIOSH Approved for HF | | | | | | | | | | | | | | | | | 1 |
| Flexi-Filter Pads* for Advantage® Respirators | 818346 818347 | Flexi-Filter N95 Flexi-Filter N95 with Nuisance Level OV and Ozone Removal | | | | | | | | | | | | | | | | | 1 |

* Escape only. ** Effective against, but not NIOSH approved for Iodine Vapor.

† ShortStack is a registered trademark of MSA.

ADVANTAGE® 200 LS
(Small, Medium, Large)

ULTRA-TWIN®
(Small, Medium, Large)

COMFO CLASSIC®
(Small, Medium, Large)
(Hycar Rubber & Silicons)

ADVANTAGE® 3200
(Small, Medium, Large)

ULTRA ELITE®
(Small, Medium, Large)

COMFO ELITE®
(Small, Medium, Large)

ADVANTAGE® 100
(Small, Medium, Large)

42 CFR Part 84
COMPLIANT
Respirator Cartridges from MSA

42 CFR Parte 84
CUMPLE CON ESTÁNDAR
Cartuchos de Protección Respiratoria de MSA

WALL CHART
Afiche

Small: Face Piece connects only to standard MSA respirators. Medium: Face Piece connects to standard MSA respirators. Large: Face Piece connects to standard MSA respirators. All sizes are available in standard and custom configurations. For more information, contact your MSA representative or visit us online at www.msa.com.

Options: Respirators are available in standard and custom configurations. For more information, contact your MSA representative or visit us online at www.msa.com.

Options and representative worldwide for more information.

NOTES

- Do not use in atmospheres containing less than 19.5% oxygen, in atmospheres containing gases or vapors or in atmospheres immediately dangerous to life or health.
- Do not use in atmospheres containing less than 19.5% oxygen, or in atmospheres immediately dangerous to life or health.
- Do not wear for protection against organic vapors which generate high heats of reaction with the sorbent material in the cartridge.
- 99.97% efficient against 0.3 micron particulates MMAOD (Mass Median Aerodynamic Diameter).
- If using against organic vapor substances having poor warning properties, take appropriate additional precautions to prevent over-exposure.

NIOSH does not assign TC numbers to cartridges, only to respirators with cartridges.

DEFINITIONS

- N95:** Particulate Filter (95% filter efficiency level) effective against particulate aerosols free of oil; time use restrictions may apply.
- R95:** Particulate Filter (95% filter efficiency level) effective against particulate aerosols; time use restrictions may apply.
- P100:** Particulate Filter (99.97% filter efficiency level) effective against all particulate aerosols.

WARNING

An appropriate cartridge change-out schedule must be developed by a qualified professional, unless the cartridge/canister utilizes an end-of-service-life indicator. The change-out schedule must take into account all factors that may influence respiratory protection including specific work practices and other conditions unique to the workers' environment. If using against substances having poor warning properties, there is no secondary means of knowing when to replace the cartridges/canister. In such cases, take appropriate additional precautions to prevent overexposure, which may include a more conservative change-out schedule or using an air-supplied respirator or SCBA. Failure to follow this warning can result in serious personal injury or death. As a reference, below is a partial list of substances having poor warning properties:

| | | | |
|------------------|--------------------|------------------|-------------------------------|
| Acrolein | Hydrogen Cyanide | Nitric Acid | Phosphorus Trichloride |
| Aniline | Hydrogen Selenide | Nitro Compounds: | Sibline |
| Arsine | Methanol | Nitrogen Oxides | Sulfur Chloride |
| Bromine | Methyl Bromide | Nitroglycerin | Urethane or other |
| Carbon Monoxide | Methyl Chloride | Nitromethane | Disocyanate-containing paints |
| Diisocyanates | Methylene Chloride | Phosgene | Vinyl Chloride |
| Dimethyl Sulfate | Nickel Carbonyl | Phosphine | |

OSHA INFOSHEET

Respirator Medical Evaluation Questionnaire

Respirators must be used in workplaces in which employees are exposed to hazardous airborne contaminants. When respiratory protection is required employers must have a respirator protection program as specified in OSHA's Respiratory Protection standard (29 CFR 1910.134). Before wearing a respirator, workers must first be medically evaluated using the mandatory medical questionnaire or an equivalent method. To facilitate these medical evaluations, this INFOSHEET includes the mandatory medical questionnaire to be used for these evaluations.

Medical Evaluation and Questionnaire Requirements

The requirements of the medical evaluation and for using the questionnaire are provided below:

- The employer must identify a physician or other licensed health care professional (PLHCP) to perform all medical evaluations using the medical questionnaire in Appendix C of the Respiratory Protection standard or a medical examination that obtains the same information. (See Paragraph (e)(2)(i).)
- The medical evaluation must obtain the information requested in Sections 1 and 2, Part A of Appendix C. The questions in Part B of Appendix C may be added at the discretion of the health care professional. (See Paragraph (e)(2)(ii).)
- The employer must ensure that a follow-up medical examination is provided for any employee who gives a positive response to any question among questions 1 through 8 in Part A Section 2, of Appendix C, or whose initial medical examination demonstrates the need for a follow-up medical examination. The employer must provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP. (See Paragraph (e)(3)(i).)
- The medical questionnaire and examinations must be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee and in a manner that ensures that he or she understands its content. The employer must not review the employee's responses, and the questionnaire must be provided directly to the PLHCP. (See Paragraph (e)(4)(i).)

Excerpt from Appendix C of 29 CFR 1910.134: OSHA Respirator Medical Evaluation Questionnaire

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee: Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Once filled out, this form must be given to the PLHCP. This form should **not** be submitted to OSHA.

1. Today's date:
2. Your name:
3. Your age (to nearest year):
4. Sex (circle one): Male/Female
5. Your height: ft. in.
6. Your weight: lbs.
7. Your job title:
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code):
9. The best time to phone you at this number:
10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No
11. Check the type of respirator you will use (you can check more than one category):
 - a. ____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
 - b. ____ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
12. Have you worn a respirator (circle one): Yes/No If "yes," what type(s):

| | YES | NO |
|---|--------------------------|--------------------------|
| 1. Do you <i>currently</i> smoke tobacco, or have you smoked tobacco in the last month? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Have you <i>ever had</i> any of the following conditions? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Seizures | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Diabetes (sugar disease) | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Allergic reactions that interfere with your breathing | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Claustrophobia (fear of closed-in places) | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Trouble smelling odors | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Have you <i>ever had</i> any of the following pulmonary or lung problems? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Asbestosis | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Asthma | <input type="checkbox"/> | <input type="checkbox"/> |

| | YES | NO |
|---|--------------------------|--------------------------|
| c. Chronic bronchitis | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Emphysema | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Pneumonia | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Tuberculosis | <input type="checkbox"/> | <input type="checkbox"/> |
| g. Silicosis | <input type="checkbox"/> | <input type="checkbox"/> |
| h. Pneumothorax (collapsed lung) | <input type="checkbox"/> | <input type="checkbox"/> |
| i. Lung cancer | <input type="checkbox"/> | <input type="checkbox"/> |
| j. Broken ribs | <input type="checkbox"/> | <input type="checkbox"/> |
| k. Any chest injuries or surgeries | <input type="checkbox"/> | <input type="checkbox"/> |
| l. Any other lung problem that you've been told about | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Do you <i>currently</i> have any of the following symptoms of pulmonary or lung illness? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Shortness of breath | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Shortness of breath when walking with other people at an ordinary pace on level ground | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Have to stop for breath when walking at your own pace on level ground | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Shortness of breath when washing or dressing yourself | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Shortness of breath that interferes with your job | <input type="checkbox"/> | <input type="checkbox"/> |
| g. Coughing that produces phlegm (thick sputum) | <input type="checkbox"/> | <input type="checkbox"/> |
| h. Coughing that wakes you early in the morning | <input type="checkbox"/> | <input type="checkbox"/> |
| i. Coughing that occurs mostly when you are lying down | <input type="checkbox"/> | <input type="checkbox"/> |
| j. Coughing up blood in the last month | <input type="checkbox"/> | <input type="checkbox"/> |
| k. Wheezing | <input type="checkbox"/> | <input type="checkbox"/> |
| l. Wheezing that interferes with your job | <input type="checkbox"/> | <input type="checkbox"/> |
| m. Chest pain when you breathe deeply | <input type="checkbox"/> | <input type="checkbox"/> |
| n. Any other symptoms that you think may be related to lung problems | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Have you <i>ever had</i> any of the following cardiovascular or heart problems? | | |
| a. Heart attack | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Stroke | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Angina | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Heart failure | <input type="checkbox"/> | <input type="checkbox"/> |

| | YES | NO |
|--|--------------------------|--------------------------|
| e. Swelling in your legs or feet (not caused by walking) | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Heart arrhythmia (heart beating irregularly) | <input type="checkbox"/> | <input type="checkbox"/> |
| g. High blood pressure | <input type="checkbox"/> | <input type="checkbox"/> |
| h. Any other heart problem that you've been told about | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Have you <i>ever had</i> any of the following cardiovascular or heart symptoms? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Frequent pain or tightness in your chest | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Pain or tightness in your chest during physical activity | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Pain or tightness in your chest that interferes with your job | <input type="checkbox"/> | <input type="checkbox"/> |
| d. In the past two years, have you noticed your heart skipping or missing a beat | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Heartburn or indigestion that is not related to eating | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Any other symptoms that you think may be related to heart or circulation problems | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Do you <i>currently</i> take medication for any of the following problems? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Breathing or lung problems | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Heart trouble | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Blood pressure | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Seizures | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. If you've used a respirator, have you <i>ever had</i> any of the following problems? (If you've never used a respirator, check the following space and go to question 9.) <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Eye irritation | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Skin allergies or rashes | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Anxiety | <input type="checkbox"/> | <input type="checkbox"/> |
| d. General weakness or fatigue | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Any other problem that interferes with your use of a respirator | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire? | <input type="checkbox"/> | <input type="checkbox"/> |
| <p>Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.</p> | | |
| 10. Have you <i>ever lost</i> vision in either eye (temporarily or permanently)? | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Do you <i>currently</i> have any of the following vision problems? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Wear contact lenses | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Wear glasses | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Color blind | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Any other eye or vision problem | <input type="checkbox"/> | <input type="checkbox"/> |

| | YES | NO |
|--|--------------------------|--------------------------|
| 12. Have you <i>ever had</i> an injury to your ears, including a broken eardrum? | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Do you <i>currently</i> have any of the following hearing problems? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Difficulty hearing | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Wear a hearing aid | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Any other hearing or ear problem | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Have you <i>ever had</i> a back injury? | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Do you <i>currently</i> have any of the following musculoskeletal problems? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Weakness in any of your arms, hands, legs, or feet | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Back pain | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Difficulty fully moving your arms and legs | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Pain and stiffness when you lean forward or backward at the waist | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Difficulty fully moving your head up or down | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Difficulty fully moving your head side to side | <input type="checkbox"/> | <input type="checkbox"/> |
| g. Difficulty bending at your knees | <input type="checkbox"/> | <input type="checkbox"/> |
| h. Difficulty squatting to the ground | <input type="checkbox"/> | <input type="checkbox"/> |
| i. Climbing a flight of stairs or a ladder carrying more than 25 lbs. | <input type="checkbox"/> | <input type="checkbox"/> |
| j. Any other muscle or skeletal problem that interferes with using a respirator | <input type="checkbox"/> | <input type="checkbox"/> |

This infosheet does not include the questions in Part B because they are not mandatory; rather, they may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

OSHA Educational Materials

OSHA has an extensive publications program. For a listing of free items, visit OSHA's web site at www.osha.gov/publications or contact the OSHA Publications Office, U.S. Department of

Labor, 200 Constitution Avenue, N.W., N-3101, Washington, DC 20210. Telephone (202) 693-1888 or fax to (202) 693-2498.

Contacting OSHA

To report an emergency, file a complaint or seek OSHA advice, assistance or products, call (800) 321-OSHA (6742) or contact your nearest OSHA regional, area, or State Plan office; TTY: 1-877-889-5627.

This InfoSheet is not a standard or regulation, and it creates no new legal obligations. It contains recommendations as well as descriptions of mandatory safety and health standards. The recommendations are advisory in nature, informational in content, and are intended to assist employers in providing a safe and healthful workplace. The *Occupational Safety and Health Act* requires employers to comply with safety and health standards and regulations promulgated by OSHA or by a state with an OSHA-approved state plan. In addition, the Act's General Duty Clause, Section 5(a)(1), requires employers to provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm.



APPENDIX 7

DOT WARNING LABELS AND PLACARDS



U.S. Department
of Transportation
Pipeline and
Hazardous Materials
Safety Administration

DOT CHART 15

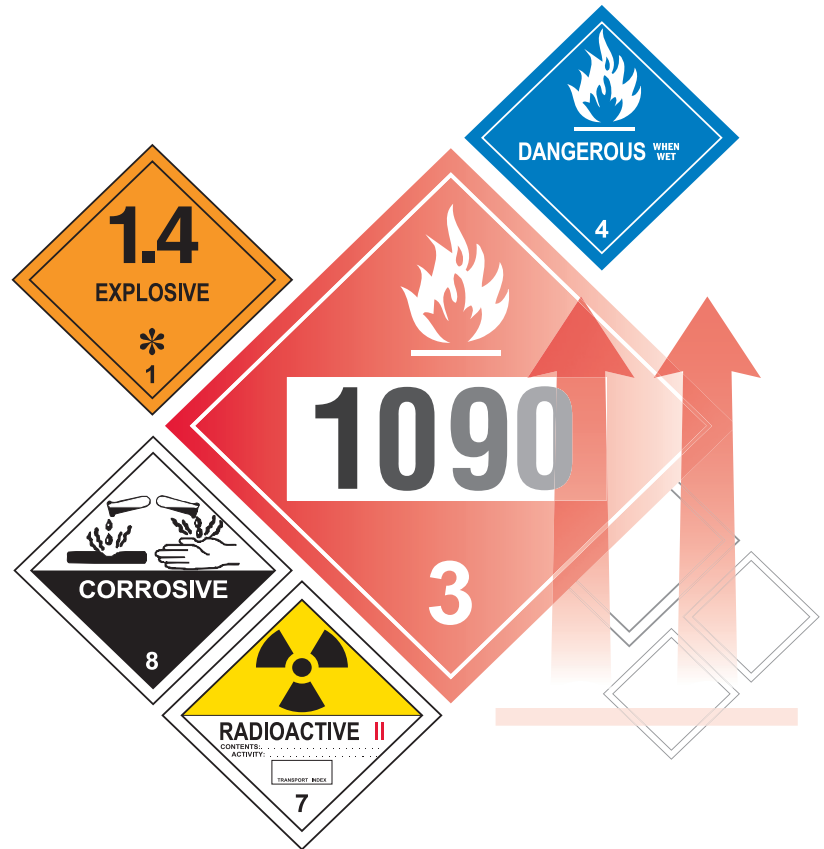
Hazardous Materials Markings, Labeling and Placarding Guide

Refer to 49 CFR, Part 172:

Marking - Subpart D

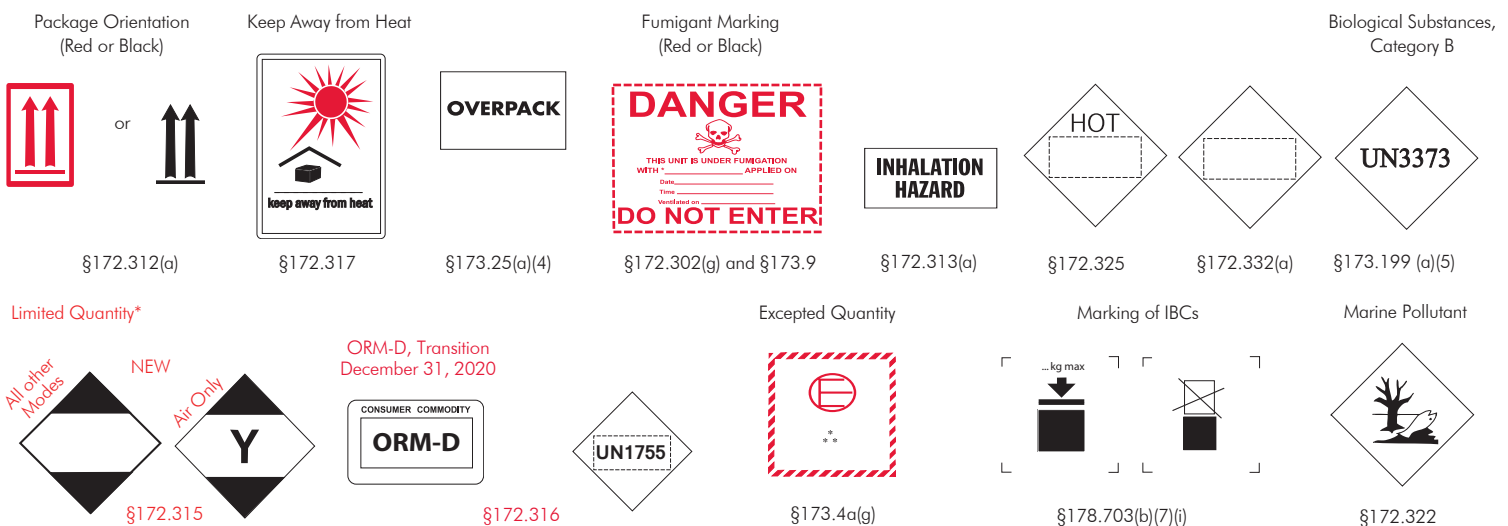
Labeling - Subpart E

Placarding - Subpart F



NOTE: This document is for general guidance only and should not be used to determine compliance with 49 CFR, Parts 100-185.

HAZARDOUS MATERIALS MARKINGS



* The new limited quantity marking designates hazardous material packages prepared for air transport (Y) and packages not prepared for air transport (all other modes). The ORM-D classification and the use of packaging marked "Consumer commodity, ORM-D" is authorized until December 31, 2020, for domestic highway, rail, and vessel transportation. Transitional exception—Square-on-point with Identification Number: except for transportation by aircraft and until December 31, 2014, a package containing a limited quantity may be marked with identification number, preceded by the letters "UN" or "NA".

Hazardous Materials Warning Labels

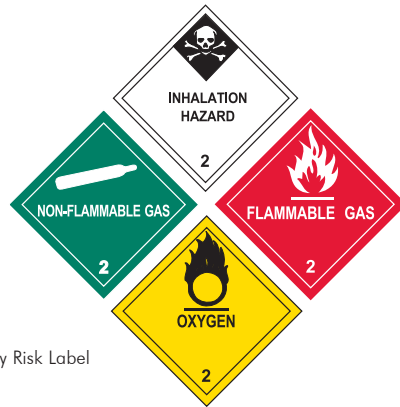
Actual label size: at least 100 mm (3.9 inches) on all sides

CLASS 1 Explosives: Divisions 1.1, 1.2, 1.3, 1.4, 1.5, 1.6



§172.411

CLASS 2 Gases: Divisions 2.1, 2.2, 2.3



§172.405(b), §172.415, §172.416, §172.417

CLASS 3 Flammable Liquid



§172.419

CLASS 4 Flammable Solid, Spontaneously Combustible, and Dangerous When Wet: Divisions 4.1, 4.2, 4.3



§172.420, §172.422, §172.423

CLASS 5 Oxidizer, Organic Peroxide: Divisions 5.1 and 5.2



§172.426, §172.427

* Include compatibility group letter.

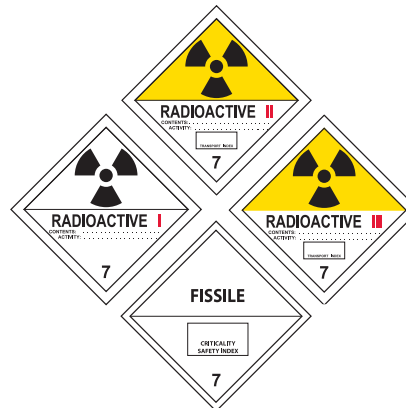
** Include division number and compatibility group letter.

CLASS 6 Poison (Toxic), Poison Inhalation Hazard, Infectious Substance: Divisions 6.1 and 6.2



§172.323, §172.405(c), §172.429, §172.430, §172.432

CLASS 7 Radioactive



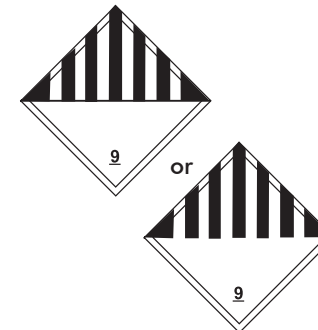
§172.436, §172.438, §172.440, §172.441

CLASS 8 Corrosive



§172.442

CLASS 9 Miscellaneous Hazardous Material



§172.446

Cargo Aircraft Only



§172.448

Empty Label



§172.450

For Regulated Medical Waste (RMW), an Infectious Substance label is not required on an outer packaging if the OSHA Biohazard marking is used as prescribed in 29 CFR 1910.1030(g). A bulk package of RMW must display a BIOHAZARD marking.

Hazardous Materials Warning Placards

Actual placard size: at least 250 mm (9.84 inches) on all sides

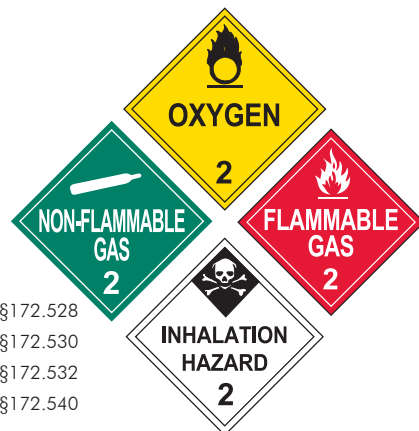
CLASS 1 Explosives



§172.522
§172.523
§172.524
§172.525

* For Divisions 1.1, 1.2, or 1.3, enter division number and compatibility group letter, when required; placard any quantity. For Divisions 1.4, 1.5, and 1.6, enter compatibility group letter, when required; placard 454 kg (1,001 lbs) or more.

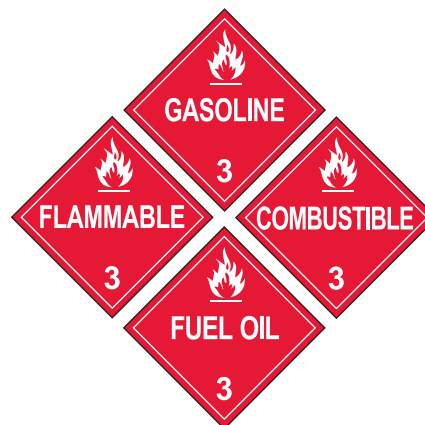
CLASS 2 Gases



§172.528
§172.530
§172.532
§172.540

For NON-FLAMMABLE GAS, OXYGEN (compressed gas or refrigerated liquid), and FLAMMABLE GAS, placard 454 kg (1,001 lbs) or more gross weight. For POISON GAS (Division 2.3), placard any quantity.

CLASS 3 Flammable Liquid and Combustible Liquid



§172.542
§172.544

For FLAMMABLE, placard 454 kg (1,001 lbs) or more. GASOLINE may be used in place of FLAMMABLE placard displayed on a cargo tank or portable tank transporting gasoline by highway. Placard combustible liquid transported in bulk. See §172.504(f)(2) for use of FLAMMABLE placard in place of COMBUSTIBLE. FUEL OIL may be used in place of COMBUSTIBLE on a cargo or portable tank transporting fuel oil not classed as a flammable liquid by highway.

CLASS 4 Flammable Solid, Spontaneously Combustible, and Dangerous When Wet



§172.546, §172.547, §172.548

For FLAMMABLE SOLID and SPONTANEOUSLY COMBUSTIBLE, placard 454 kg (1,001 lbs) or more. For DANGEROUS WHEN WET (Division 4.3), placard any quantity.

CLASS 5 Oxidizer & Organic Peroxide



Organic Peroxide, Transition-2011 (rail, vessel, and aircraft)
2014 (highway)

§172.550, §172.552

For OXIDIZER and ORGANIC PEROXIDE (other than TYPE B, temperature controlled), placard 454 kg (1,001 lbs) or more. For ORGANIC PEROXIDE (Division 5.2), Type B, temperature controlled, placard any quantity.

CLASS 6 Poison (Toxic) and Poison Inhalation Hazard



§172.504(f)(10), §172.554, §172.555

For POISON (PGI or PGII, other than inhalation hazard) and POISON (PGIII), placard 454 kg (1,001 lbs) or more. For POISON-INHALATION HAZARD (Division 6.1), inhalation hazard only, placard any quantity.

CLASS 7 Radioactive



§172.556

Placard any quantity - packages bearing RADIOACTIVE YELLOW-III labels only. Certain low specific activity radioactive materials in "exclusive use" will not bear the label, but the radioactive placard is required for exclusive use shipments of low specific activity material and surface contaminated objects transported in accordance with §172.504(e) Table 1 and §173.427(a)(6).

CLASS 8 Corrosive



§172.558

For CORROSIVE, placard 454 kg (1,001 lbs) or more.

CLASS 9 Miscellaneous



§172.560

Not required for domestic transportation. A bulk packaging containing a Class 9 material must be marked with the appropriate ID number displayed on a Class 9 placard, an orange panel, or a white square-on-point display.

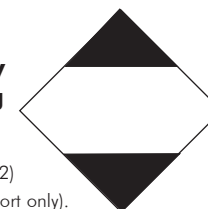
Dangerous



§172.521

A freight container, unit load device, transport vehicle, or rail car which contains non-bulk packages with two or more categories of hazardous materials that require different placards specified in Table 2 §172.504(e) may be placarded with DANGEROUS placards instead of the specific placards required for each of the materials in Table 2. However, when 1,000 kg (2,205 lbs) or more of one category of material is loaded at one loading facility, the placard specified in Table 2 must be applied.

Limited Quantity Marking



§172.315(a)(2)
(Vessel transport only).

Safety begins with communication!

General Guidelines on Use of Warning Labels and Placards

LABELS

See 49 CFR, Part 172, Subpart E, for complete labeling regulations.

- The Hazardous Materials Table [§172.101, Col. 6] identifies the proper label(s) for the hazardous material listed.
- Any person who offers a hazardous material for transportation MUST label the package, if required [§172.400(a)].
- Labels may be affixed to packages when not required by regulations, provided each label represents a hazard of the material contained in the package [§172.401].
- For labeling mixed or consolidated packages, see §172.404.
- The appropriate hazard class or division number must be displayed in the lower corner of a primary and subsidiary hazard label [§172.402(b)].
- For classes 1,2,3,4,5,6, and 8, text indicating a hazard (e.g., "CORROSIVE") is NOT required on a primary or subsidiary label. The label must otherwise conform to Subpart E of Part 172 [§172.405].
- Labels must be printed on or affixed to the surface of the package near the proper shipping name marking [§172.406(a)].
- When primary and subsidiary labels are required, they must be displayed next to each other [§172.406(c)].
- For a package containing a Division 6.1, PG III material, the POISON label specified in §172.430 may be modified to display the text PG III instead of POISON or TOXIC. Also see §172.405(c).
- The ORGANIC PEROXIDE label [§172.427] indicates that organic peroxides are highly flammable. Use of the ORGANIC PEROXIDE label eliminates the need for a flammable liquid subsidiary label. The color of the border must be black and the color of the flame may be black or white.

PLACARDS

See 49 CFR, Part 172, Subpart F, for complete placarding regulations.

- Each person who offers for transportation or transports any hazardous material subject to the Hazardous Materials Regulations must comply with all applicable requirements of Subpart F [§172.500].
- Placards may be displayed for a hazardous material, even when not required, if the placarding otherwise conforms to the requirements of Subpart F of Part 172 [§172.502(c)].
- For other than Class 7 or the DANGEROUS placard, text indicating a hazard (e.g., "FLAMMABLE") is not required. Text may be omitted from the OXYGEN placard only if the specific ID number is displayed on the placard [§172.519(b)(3)].
- For a placard corresponding to the primary or subsidiary hazard class of a material, the hazard class or division number must be displayed in the lower corner of the placard [§172.519(b)(4)].
- Except as otherwise provided, any bulk packaging, freight container, unit load device, transport vehicle or rail car containing any quantity of material listed in Table 1 must be placarded [§172.504].
- When the aggregate gross weight of all hazardous materials in non-bulk packages covered in Table 2 is less than 454 kg (1,001 lbs), no placard is required on a transport vehicle or freight container when transported by highway or rail [§172.504(c)].
- Notes: See §172.504(f)(10) for placarding Division 6.1, PG III materials.
- Placarded loads require registration with USDOT. See §107.601 for registration regulations.
- The new ORGANIC PEROXIDE placard became mandatory 1 January 2011 for transportation by rail, vessel, or aircraft and becomes mandatory 1 January 2014 for transportation by highway. The placard will enable transport workers to readily distinguish peroxides from oxidizers [§172.552].

PLACARDING TABLES

[§172.504(e)]

TABLE 1

| Category of material (Hazard Class or division number and additional description, as appropriate) | Placard name |
|---|--------------------------------|
| 1.1..... | EXPLOSIVES 1.1..... |
| 1.2..... | EXPLOSIVES 1.2..... |
| 1.3..... | EXPLOSIVES 1.3..... |
| 2.3..... | POISON GAS..... |
| 4.3..... | DANGEROUS WHEN WET..... |
| 5.2 (Organic peroxide, Type B, liquid or solid, temperature controlled)..... | ORGANIC PEROXIDE..... |
| 6.1 (Materials poisonous by inhalation (see §171.8))..... | POISON INHALATION HAZARD..... |
| 7 (Radioactive Yellow III label only)..... | RADIOACTIVE ¹ |

¹RADIOACTIVE placard also required for exclusive use shipments of low specific activity material and surface contaminated objects transported in accordance with §173.427(b)(4) and (5) or (c) of the subchapter.

TABLE 2

| Category of material (Hazard Class or division number and additional description, as appropriate) | Placard name |
|---|-----------------------------------|
| 1.4..... | EXPLOSIVES 1.4..... |
| 1.5..... | EXPLOSIVES 1.5..... |
| 1.6..... | EXPLOSIVES 1.6..... |
| 2.1..... | FLAMMABLE GAS..... |
| 2.2..... | NON-FLAMMABLE GAS..... |
| 3..... | FLAMMABLE..... |
| Combustible Liquid..... | COMBUSTIBLE..... |
| 4.1..... | FLAMMABLE SOLID..... |
| 4.2..... | SPONTANEOUSLY COMBUSTIBLE..... |
| 5.1..... | OXIDIZER..... |
| 5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled)..... | ORGANIC PEROXIDE..... |
| 6.1 (Other than materials poisonous by inhalation)..... | POISON..... |
| 6.2..... | (None)..... |
| 8..... | CORROSIVE..... |
| 9..... | Class 9 (See §172.504(f)(9))..... |
| ORM-D..... | (None)..... |

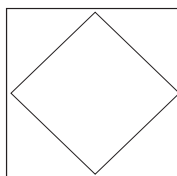
IDENTIFICATION NUMBER DISPLAYS



§172.332

Appropriate placard must be used with orange panel.

IDENTIFICATION NUMBER MARKINGS ON ORANGE PANELS OR APPROPRIATE PLACARDS MUST BE DISPLAYED ON: (1) Tank Cars, Cargo Tanks, Portable Tanks, and other Bulk Packagings; (2) Transport vehicles or freight containers containing 4,000 kg (8,820 lbs) in non-bulk packages of only a single hazardous material having the same proper shipping name and identification number loaded at one facility and transport vehicle contains no other material, hazardous or otherwise; and (3) transport vehicles or freight containers containing 1,000 kg (2,205 lbs) of non-bulk packages of materials poisonous by inhalation in Hazard Zone A or B. See §§172.301(a)(3), 172.313(c), 172.326, 172.328, 172.330, and 172.331.



§172.527

Square white background required for placard for highway route controlled quantity radioactive material and for rail shipment of certain explosives and poisons, and for flammable gas in a DOT 113 tank car (§172.507 and §172.510).

This Chart is available online at the following link:
<http://phmsa.dot.gov/hazmat>



U.S. Department
of Transportation

Pipeline and
Hazardous Materials
Safety Administration

USDOT/PHMSA/OHMIT/PHH-50
1200 New Jersey Avenue, SE
Washington, D.C. 20590
Phone: (202) 366-4900
Email: training@dot.gov

PHH50-0138-0413

APPENDIX 8

LOCKOUT/TAGOUT TRAINING AND GENERAL PROCEDURE



J. J. White, Inc.

Lockout/Tagout Employee Training

I. PURPOSE:

This training must be provided to all “authorized”, “affected”, or “other” employees whenever:

- A. A new Lockout/ Tagout program is instituted at a jobsite;
- B. A new employee is employed where an existing Lockout/ Tagout program is in effect; or
- C. Annually for all employees.

II. Training Outline:

- A. All locks and tags must clearly identify the employee who applies them.
- B. There must be a “Site Specific” review of the specific dangers being guarded against.
- C. All employees must review J. J. White Inc.’s general Lockout/ Tagout procedure (see next page).
- D. In accordance with OSHA Regulations, this review identifies three types of employees:
 - 1. Authorized Employees- those charged with the responsibility of implementing Lockout/Tagout Procedures.
 - 2. Affected Employees – usually the operators or users of equipment.
 - 3. Other Employees – those who need to understand the purpose of Lockout/Tagout and to recognize that Lockout/Tagout is in place.
- E. Affected and other employees need to know only one thing – when Lockout/Tagout is in place, leave it alone and do not try to operate the equipment.

J. J. WHITE, INC.

GENERAL LOCKOUT/TAGOUT PROCEDURE

I. Review

Review the established lockout/tagout procedure with all employees in the affected work area.

II. Responsibility

Assign one individual the responsibility of maintaining control of lockout and enforcing and coordinating the lockout procedure. Assign another individual as an alternate. That person should have a full understanding of the lockout/tagout procedure. Both parties are considered the authorized person.

III. Shutdown

Equipment to be locked out shall be shutdown by normal operation procedure, i.e., valve, stop button, toggle switch or other switching device.

IV. Isolate

Isolate the equipment to be locked out from its primary energy source. Special care should be taken to insure that all energy sources are located. Some equipment may have multiple energy sources.

V. Stored Energy

All Stored Energy, whether spring loaded, hydraulic, air, gas, steam, or electrical, must be released and/or bled down. Care should be taken that all affected personnel are aware that this activity will be taking place.

VI. Lockout/Tagout

Lockout and/or tagout the energy isolating device(s) with assigned individual locks and/or tags.

Note: Physical lockout is always the preferred method whenever possible and is J. J. White Inc.'s policy.

VII. Safety Check:

Operate normal controls for equipment to ensure that the lockout/tagout is successful.

VIII. Restoration of Energy to Equipment

Alert all affected employees that the lockout/tagout device is being removed and assure that all employees are in a safe location. Ensure that all tools and equipment are removed and all normal safety guards have been reinstalled. Make sure the normal operation switch or valve is in the OFF position.

IX. Removal of Lockout/ Tagout:

Only after all requirements of item VII have been checked and met, may the responsible individual remove the lockout/tagout device and restore energy to the equipment.

Note #1

It is J. J. White Inc.'s policy to install blinds on piping behind the first valve whenever possible.

Note #2

Due to the ever changing nature and location of work in the J. J. White Inc.'s organization, a "Site Specific" Lockout/Tagout Procedure may need to be created. A J. J. White Inc.'s safety coordinator, job superintendent, and Owner representative are required to approve any special conditions for "Site Specific" lockout/tagout.

Note #3

Due to the nature of some of work processes, there may be occasions when a lockout/tagout must be temporarily lifted to test a piece of equipment. In this case, a temporary lockout/tagout lift plan must be completed and reviewed with the entire work crew.



J. J. White, Inc.

Lockout/Tagout

Checklist and Signoff Sheet

This form shall be used to assure that all points of the J. J. White, Inc. Lockout/ Tagout program have been addressed and all affected employees are alerted to the implementation of this program.

General Information:

(Please Print All Information Requested for Question Numbers 1 through 3 below.)

| | |
|----|---|
| 1. | Name of Authorized Individual (J. J. White, Inc. Employee): |
| 2. | Name of Owner's Representative and Company Name: |
| 3. | Name of Item, Machine, or Unit to be Locked Out: |

Specific Requirements before Work Can Begin:

(Please Circle Appropriate Response for Question Numbers 4 through 10 Below.)

| | | | |
|-----|---|-----|----|
| 4. | Has the Unit been shut down by normal operating procedures? | Yes | No |
| 5. | Have all energy sources been identified? | Yes | No |
| 6A. | Has the Unit been isolated – ALL Blanks & Blinds Installed? | Yes | No |
| 6B. | Has the Unit been isolated – ALL Pumps & Motors Isolated? | Yes | No |
| 6C. | Has the Unit been isolated? – All Electrical Connections Isolated? | Yes | No |
| 6D. | Has the Unit been isolated? – ALL Valves Shut (Where Blinds Can Not Be Installed)? | Yes | No |
| 7. | Has all stored energy (Air, Gas, Steam, Electrical, Hydraulic or Spring Loaded) been bled down? | Yes | No |

Lockout/Tagout Employee Training Guide – J.J. White, Inc.

| | | | |
|-----|--|-----|----|
| 8A. | Have all Locks and/or Tags been applied to all of the aforementioned energy sources? | Yes | No |
| 8B. | Lockout/ Tagout is J. J. White, Inc.'s policy whenever possible. However, if the answer to 8A. above is "NO" then identify the following: Energy Source: Location: Explanation for No Lockout/ Tagout applied: | | |
| 9. | All normal controls (Valves, Start/Stop Buttons, Toggle Switches, etc.) must be operated to assure Lockout/ Tagout is successful. Has this activity taken place? | Yes | No |
| 10. | Have All affected employees reviewed the J. J. White, Inc. Lockout/ Tagout procedure? (Owners, Sub-Contractors, and J. J. White, Inc. Personnel.) | Yes | No |

It is essential that ALL of the above be completed in the affirmative before work may proceed, with the exception of Number 8A above, but then Number 8B MUST be completed.

After all work is completed, and the restoration of power is permitted ONLY after the following items listed below have been addressed in the affirmative.

Restoration of Power:

(Please Circle Appropriate Response for Question Numbers 11 through 14.)

| | | | |
|-----|---|-----|----|
| 11. | Have All affected employees been notified the Lockout/ Tagout is being removed? | Yes | No |
| 12. | Are All affected employees safely positioned? | Yes | No |
| 13. | Are All tools and equipment removed and All normal safety guards in place? | Yes | No |
| 14. | Are All normal operating valves and switches in the "OFF" position? | Yes | No |

It is essential that ALL of the above MUST be completed in the affirmative before the Lockout/ Tagout procedure can be eliminated. There is no exception to this rule.

Personnel Record Program:

(Please Circle Appropriate Response for Question Number 15 Below.)

| | | | |
|-----|--|-----|----|
| 15. | Will the J. J. White, Inc., Sign In/ Sign Out sheet be used? | Yes | No |
|-----|--|-----|----|

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By my signature below, I hereby certify that all question in Item Numbers 1 through 10 above were answered in the affirmative and that work may start on the Locked Out/ Tagged Out Item.

Signature of Company Representative

Date

Print Name of Company Representative

Name of Company

Signature of J. J. White, Inc., Superintendent

Date

Print Name of J. J. White, Inc., Superintendent



J. J. White, Inc.

Daily Sign In/ Sign Out Sheet for All Affected Employees

Working Under a Lockout/ Tagout Program

All employees working under the J. J. White, Incorporated Lockout/ Tagout program are required to sign in at the beginning of each shift and sign out at the end of each shift. No one may sign before they are ready to leave at the end of the shift.

Anyone signing out prematurely shall be disciplined, and potentially subject to dismissal!

| | |
|-------|-------|
| Site: | Date: |
|-------|-------|

Please sign your name legibly when signing in and out, and denote the time accurately for each entry made.

| Employees Signature SIGN IN | TIME IN | Employees Signature SIGN OUT | TIME OUT |
|---------------------------------------|----------------|--|-----------------|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |



J. J. White, Inc.

Temporary Lockout/ Tagout Lift Plan

| |
|----------------------------------|
| Date: |
| Location: |
| Project: |
| Scope: |
| Duration of LOTO Removal: |

NOTES: No subcontractor may perform a temporary LOTO lift without written approval of the site Superintendent.

Requirements before LOTO can be removed:

(Circle Appropriate Responses for questions 1 through 4)

| | | |
|--|-----|----|
| 1. Have all affected employees/ subcontractors been notified that the LOTO will be removed? | Yes | No |
| 2. Have all affected employees/ subcontractors been notified as to length of time LOTO will be off? | Yes | No |
| 3. Have all affected employees/ subcontractors been made aware of the scope of work being performed under the temporary lifting of LOTO. | Yes | No |
| 4. Are all affected employees/subcontractors in a safe position while testing/checking of equipment is being conducted. | Yes | No |
| 5. All affected employees/ subcontractors must sign off that they have a full understanding of the scope of work about to be completed. | | |
| 6. Duration of temporary lift cannot exceed the normal work shift. | | |
| 7. ONLY after all of the above steps have been met can the LOTO be removed by the Authorized persons. | | |

Requirements after LOTO is removed and testing is completed:

| |
|--|
| 1. A separate high hazard JSA must be completed prior to commencing Testing. |
| 2. LOTO to be reset once testing is completed and verification of LOTO must be done by Foreman for all crews affected. |
| 3. A new JSA must be done or the original one re-validated prior to work re-starting. |



J. J. White, Inc.

Temporary Lockout/ Tagout Lift Plan

Employee Acknowledgement:

| Print Name | Signature |
|-------------------|------------------|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
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| | |

APPENDIX 9

CONFINED SPACES IN CONSTRUCTION



J. J. White, Inc.

**Confined Space in Construction
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I. 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 §1926.1201(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); incinerators; scrubbers; 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; air receivers; sludge gates; air preheaters; step up transformers; turbines; chillers; bag houses; 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.

II. Definitions

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

Acceptable entry conditions means the conditions that must exist in a permit space, before an employee may enter that space, to ensure that employees can safely enter into, 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 is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has 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 means 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 or not such action is intentional or any work activities are actually 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, as long as 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 the course of 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 a distance of 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 considered to be "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 similar to, 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.

III. General requirements.

- (a) Before it begins work at a worksite, each employer 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

Note to paragraph §1926.1203(b)(1). 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 any employer decides that employees it directs will enter a permit space, that employer must 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) An employer 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) An employer whose employees enter a permit space need not comply with §§1926.1204 through 1206 and §§1926.1208 through 1211, provided that all of the following conditions are met:

- (i) The employer 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) The employer 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) The employer 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 the employer 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) The employer 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) The employer 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 of 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 of 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 at the same time that 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
- (i) 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).

- (ii) If there is no controlling contractor present at the worksite, the requirements for, and role of, controlling contractors 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.

IV. 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 inertes the space so as 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 into, 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 the course of 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 as long as 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.

V. 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.

VI. Entry permit.

The entry permit that documents compliance with this section and authorizes entry to a permit space must identify:

- (a) The permit space to be entered;
- (b) The purpose of the entry;
- (c) The date and the authorized duration of the entry permit;
- (d) The authorized entrants within the permit space, by name or by such other means (for example, through the use of rosters or tracking systems) as will enable the attendant to determine quickly and accurately, for the duration of the permit, which authorized entrants are inside the permit space;

Note to paragraph §1926.1206(d). This requirement may be met by inserting a reference on the entry permit as to the means used, such as a roster or tracking system, to keep track of the authorized entrants within the permit space.

- (e) Means of detecting an increase in atmospheric hazard levels in the event the ventilation system stops working;
- (f) Each person, by name, currently serving as an attendant;
- (g) The individual, by name, currently serving as entry supervisor, and the signature or initials of each entry supervisor who authorizes entry;
- (h) The hazards of the permit space to be entered;

- (i) The measures used to isolate the permit space and to eliminate or control permit space hazards before entry;

Note to paragraph §1926.1206(i). Those measures can include, but are not limited to, the lockout or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit spaces.

- (j) The acceptable entry conditions;
- (k) The results of tests and monitoring performed under paragraph §1926.1204(e) of this standard, accompanied by the names or initials of the testers and by an indication of when the tests were performed;
- (l) The rescue and emergency services that can be summoned and the means (such as the equipment to use and the numbers to call) for summoning those services;
- (m) The communication procedures used by authorized entrants and attendants to maintain contact during the entry;
- (n) Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided for compliance with this standard;
- (o) Any other information necessary, given the circumstances of the particular confined space, to ensure employee safety; and
- (p) Any additional permits, such as for hot work, that have been issued to authorize work in the permit space.

VII. 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) Before the employee is first assigned duties under this standard;
 - (3) Before there is a change in assigned duties;

- (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 of time the employee is employed by that employer.

VIII. 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.

IX. 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:
 - (5) Warns the unauthorized persons that they must stay away from the permit space;
 - (6) Advises the unauthorized persons that they must exit immediately if they have entered the permit space; and

- (7) Informs the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space;
- (i) Performs non-entry rescues as specified by the employer's rescue procedure; and
- (j) Performs no duties that might interfere with the attendant's primary duty to assess and protect the authorized entrants.

X. 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 the employer 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.

XI. 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 §1926.1211(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 particular 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 the employer immediately in the event that 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. The employer must 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). The employer must 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. The employer must 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 in the event that 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 the employer 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 the employer 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.

XII. 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.

XIII. Provision of documents to Secretary.

For each document required to be retained in this standard, the retaining employer must make the document available on request to the Secretary of Labor or the Secretary's designee.

APPENDIX 10

SAFETY PROGRAM FOR SCAFFOLDING



J. J. White, Inc.

**Safety Program for Scaffolds
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**J. J. White, Inc.
Safety Training Program**



**Scaffold Users
Training Module**

**“With proper planning, training and execution, all jobs can and will be completed
with Zero Injuries and 100% Safety Compliance”**

I. INTRODUCTION

All employees that are to work on scaffolds must be trained to recognize the hazards associated with the type of scaffold being used and how to control or minimize those hazards.

The training shall be conducted by a qualified person and must include:

1. Fall hazards
2. Falling object hazards
3. Electrical hazards
4. Proper Use of the Scaffold, and
5. Handling of Materials
6. Scaffold Safety Related Topics

Employees of J. J. White, Inc. are the only employees allowed to use the scaffold. If any contractor or subcontractor wishes to use the scaffold, the enclosed Scaffold Release Form must be signed. When the contractor or subcontractor signs the Scaffold Release Form, all personnel working from the scaffold must review this Scaffold User Training Module.

II. FALL PROTECTION *(Refer to the Safety Awareness Program Appendix 15 – Fall Protection)*

OSHA has identified three (3) methods of providing fall protection to employees. The methods are:

1. Guardrail Systems
2. Personal Fall Arrest Systems (PFAS)
3. Safety Net Systems

Safety Program for Scaffolds – J.J. White, Inc.

This training module focuses only on Guardrail Systems and PFAS.

Fall protection is required when working on all incomplete scaffolds beginning at platform heights 6 feet above the next lower level surface. Although OSHA requires fall protection at platform heights greater than 10 feet, it is J. J. White, Inc.'s policy to adhere to the safer of the two heights and begin fall protection at 6 feet.

When fall protection is required, it's required 100% of the time the scaffold is occupied. This means you must be connected to your fall arrest before you are exposed to an unprotected fall. Accomplishing this requires a considerable amount of planning and forethought. Fall protection must be integrated into your work plan so that work can progress without the need to stop and question how fall protection can be achieved.

Personal Fall Arrest Systems (ex. Harness and lanyard) are not required on supported scaffolds that have properly installed handrails (top and midrails) set at the proper heights, fully planked in platforms, structurally sound scaffold system and marked with a green tag indicating current inspection.

A. Guardrail Systems

Full Guardrail systems are the preferred method of providing fall protection and shall be installed whenever possible.

Toprails and midrails must be at least one-quarter inch (0.6 centimeters) nominal diameter or thickness to prevent cuts and lacerations. The top edge height of toprails must be 42 inches plus or minus 3 inches above the walking/working level. Midrails are to be installed approximately midway between the top edge of the guardrail and the platform surface.

The guardrail system must be capable of withstanding a force of at least 200 lbs. applied within 2 inches of the top edge in any outward or downward direction. Midrails must be able to withstand a force of at least 150 pounds applied in any downward or horizontal direction.

If wire rope is used for toprails, it must be flagged at not more than 6 feet intervals with high visibility material. Steel and plastic banding cannot be used as toprails or midrails.

No additional fall protection device is required on supported scaffolds that have proper handrails, complete planking and sound structure (and you do not leave the platform floor.) If the work required the worker to move above the platform height (ex. Climb on

pipe rack or use cross beam) and the protection of the handrail is lost then a PFAS (harness) must be used).

On suspended scaffolds (swing staging) a guardrail system must be used whenever feasible. For example, handrails cannot be installed on boatswain's chairs or needle beam scaffolds. Handrails can be installed, and are supplied with "Spyder" style staging, including what is commonly referred to as window washing rig or a two point adjustable suspension scaffold that has a "Spyder" on each end and an aluminum platform in between.

All persons using a suspended scaffold must also use a PFAS and you must be connected before you're exposed to an unprotected fall!

B. Personal Fall Arrest Systems (PFAS)

Personal Fall Arrest Systems consist of an anchorage, connectors, a body harness and may include a deceleration device, lifeline or suitable combination. A personal fall arrest system must

- Limit maximum arresting force on an employee to 1800 pounds when used with a harness;
- Be rigged so that an employee cannot free fall more than 6 feet or contact any lower level;
- Bring an employee to a complete stop and limit maximum deceleration distance to 3.5 feet;
- Have sufficient strength to withstand 2x the potential impact energy of an employee free-falling 6 feet or the free fall distance permitted by the system, whichever is less.

PFASs must be inspected prior to each use for wear damage and other deterioration. Defective components must be removed from service immediately. "D-rings" shall have a minimum tensile strength of 5,000 pounds.

Harnesses – Only fully body harnesses are allowed for fall protection purposes. OSHA has prohibited the use of body belts. Harnesses are to be used in conjunction with other devices for attachment to an anchor point.

Lanyards – Lanyards are the means we use to connect the harness to the anchorage point. They come in varying lengths to allow for the varying distances to an anchorage point. Lanyards can be used with a cross arm strap, rope grab or a Miller Wire Hook for attachment to an anchorage. Unless specifically designed for it, lanyards may not be "choked back" on themselves. (Miller "Backbiter" lanyards are so designed). In the event of a fall, a lanyard must keep your free fall distance to six (6) feet or less.

Retractable/Retrieval devices – These devices have the feature of automatically paying out line as you move away from the device and automatically retrieve line as you move closer to the device. These devices vary in length from ten (10) feet to one-hundred fifty (150) feet long. They are designed to detect a fall and actuate an automatic (inertia) braking system that limits free fall distances to an absolute minimum (always less than 6 feet).

Some retractable fall protection devices have the added feature of retrieval allowing for the manual retrieval of persons who have experienced a fall and are unable to perform self-rescue. Retractable/ retrieval devices are designed to permit virtually unlimited vertical movement up and down. However, extreme caution must be taken when moving horizontally. The risk of a swing fall (pendulum like motion) injury increases proportionally the further you move horizontally under the anchorage point. Horizontal movement must be kept to a minimum or serious injury may result! As with all fall protection devices, the terminal anchorage connection for these devices must be capable of supporting 5000 lbs. Retractable devices shall be anchored directly to the harnesses “D-Ring.”

Rope Grabs – These devices, like retractable lanyards, are designed to provide a high degree of mobility for **vertical** movement. However, rope grabs are designed to be used on static 5/8 or ¾ inch synthetic (ideally nylon) rope of virtually unlimited length. Rope grabs must be continually, manually adjusted for height as your elevation changes. They also present the same swing fall (pendulum) hazard as retractable devices. Rope grabs must be used with shock absorbing lanyards.

Anchorage – This is perhaps the single most important part of the fall protection equation! It is important because the need to identify suitable anchorage sites is an ongoing process. Depending on the work activity, the average worker may be required to choose several anchorage sites per task. The decision is important, because if a fall should occur, the anchor site could mean the difference between life and death!

The criteria for anchorage point selection are:

- a) Anchorage must be able to support 5000 lbs. without failure.
- b) The anchorage site for fall protection on a suspended scaffold must be independent of the site selected for the scaffold suspension lines.
- c) Anchorage sites shall be a minimum of ¾ inch standard wall welded pipe or ¾ inch structural steel member (i.e. I-beam, channel or angle iron).

Items that are **not** suitable for anchorage points include small bore pipe, any screwed joint piping, electrical conduit or cable trays. OSHA does not permit tie off to structural scaffold members, but caution must be used. The only scaffold members to be used should be those that form a corner section where handrails or bearers and runners join a vertical post and all connections are secure. The scaffold must be complete and structurally sound. Tying off to the middle of the handrail or the middle bearer or runner would not be a suitable anchorage. Using scaffolds as an anchorage point should be the last choice when identifying all anchor points.

Maintenance of Personal Fall Arrest Systems

All components of personal fall protection systems must be inspected daily for damage and wear & tear. Components to be inspected include, but are not limited to harnesses, lanyards, cross arm straps, and retractable/retrieval devices. Refer to the J. J. White, Inc. Safety Awareness Program Appendix 15 for further details on the care and maintenance of fall protection equipment.

Erection and Disassembly

As previously stated, care and forethought are required when properly selecting fall protection components and anchorage sites. The average worker is capable of accomplishing these duties after having received training in this section. For example, pipefitters working in a pipe rack should be able to identify anchorage points and plan their work accordingly. However, there will be situations that will arise that require additional training or the services of a professional engineer to design and/or establish an anchorage point system. In these cases, training for erection/disassembly of these systems shall be site specific and are not to be attempted by untrained/unqualified personnel.

III. FALLING OBJECT PROTECTION SYSTEMS

In addition to hard hats, workers on scaffolds must be protected from falling tools, debris and small objects through the use of toe boards, screens, guard rail system or through the use of debris nets, catch platforms or canopies. Objects that are too heavy to be restrained by these precautions shall be placed away from the scaffold edges and secured against movement.

When the danger of falling objects striking employees below the scaffold exists, one or more of the following precautions must be taken:

1. Toe boards installed for work platforms 6' and higher. Toe boards must withstand 50 lbs. of force applied horizontally and downward.
2. Area below the scaffold shall be barricaded to restrict all pedestrian traffic.
3. Screen or mesh installed between the top/midrail and the platform for materials stacked higher than toe boards.

4. Guardrail system installed with openings small enough to restrict objects from falling.
5. Erect canopies, catch platforms/ nets strong enough to withstand the force of falling objects.

IV. ELECTRICAL HAZARDS

A. Electrical Transmission Line

Scaffolds shall not be erected, used, dismantled, altered or moved in such a way that they or any conductive material handled on them may come closer than:

Insulated lines < 300 volts = 3 feet

Insulated lines 300 to 50,000 volts = 10 feet

Uninsulated lines < 50,000 volts = 10 feet

Uninsulated lines > 50,000 volts = 10 feet plus ¼ inches for each additional 1000 volts

To have the scaffold and materials closer than specified, the utility company or owner must be notified; the lines deenergized & locked out, relocated or protective coverings installed to prevent accidental contact before installation.

B. Electric Tools, Temporary Cords and Welding Leads

Electrical tools (such as drills and grinders) must be inspected prior to use every day, Electrical cord insulation shall be checked for nicks, tears or cuts. Grounding plugs shall be intact and strain relief devices intact.

The insulation on welding leads, both grounds and electrodes, must also be inspected daily for any breaks, tears or cuts. Minor repairs to welding lead insulation may be done only with heavy duty 3-M Insulating Tape. Regular vinyl electricians tape, friction tape or duct tape are not acceptable alternatives to insulating tape and shall never be used.

Major breaks in welding lead insulation is cause for that lead to be removed from service and must be sent back to the shop for replacement.

CAUTION: Some customers do not allow for the minor repair of welding lead insulation and require ALL welding lead to be sent to the shop for repair. Check with your customer's safety procedures for specific guidelines.

V. PROPER USE OF THE SCAFFOLD

Scaffold Modification – As a reminder, this training is intended for scaffold users only. Persons who are qualified to build, modify and dismantle scaffolds have undergone extensive training that qualifies them for that work. This training module does not allow anyone to build, alter or dismantle any scaffold. Scaffold modifications may include the removal of hand rails or planking. When modifications occur, the tagging on that scaffold may be changed and a PFAS may be needed.

Scaffold Access – When a scaffold platform is more than two (2) feet above or below a point of access, one of the following must be used:

- 1) An attachable ladder
- 2) A portable ladder
- 3) An integrated ladder (i.e. rungs built into the frame of “patent type” scaffolds, rungs shall not exceed 16 ¾ inch spacing).
- 4) A stair tower
- 5) A ramp

Cross braces are never to be used for access to a scaffold and shall never be climbed!

Inspections – A competent person before each work shift must inspect Scaffolds for visible defects. J. J. White, Inc.’s tagging system has provisions for multi-shift inspections for a single day. No one is to access a scaffold until they have confirmed that an inspection has taken place that shift and that the green or yellow tag is properly marked. Scaffolds must also be inspected after any occurrence that could affect its structural integrity.

VI. HANDLING OF MATERIALS

Material Storage – Scaffolds built for gaining access to work areas shall not be used for the storage of bulk materials waiting to be used. Excess materials shall be kept on the ground (off the scaffold) until workers are ready for the materials. Scaffolds **MUST** be kept clear of tripping hazards and prevented from reaching an overloaded condition.

Material Handling

Hand Lines shall be used for raising and lowering all small tools, equipment and material. Objects shall never be thrown from one elevation to another.

A crane or other material handling equipment shall be used for all other items too large or heavy for hand lines. A minimum of one tag line shall be used for all suspended loads on material handling equipment. For oversized or awkward loads, two tag lines shall be used.

Maximum Intended Load – All scaffolds, except aerial lifts and suspended scaffolds, shall be capable of supporting, without failure, its own weight plus 4 times the maximum intended load applied to it. For this to occur, the qualified scaffold builders must know the intended work activities that will take place on the scaffold. The scaffold users must also understand the weight limitations of the scaffold they're working on. "Intended Load" includes all personnel, tools, material, equipment and supply loads.

Maximum Intended Load for Suspended Scaffolds – Each suspension rope, and hardware used on Adjustable Suspension Scaffolds shall be capable of supporting 6 times the Maximum Intended Load applied to the rope with the scaffold operating at the rated load of the hoist, or 2 times the stall load of the hoist, whichever is greater.

Suspension ropes and hardware on non-adjustable suspension scaffold shall be capable of supporting 6 times its Maximum Intended Load.

VII. General Design Requirements

Footings

The footing or anchorage for scaffolding shall be sound, rigid, and capable of carrying the maximum anticipated load without settling or displacement. Unstable objects such as boxes, loose bricks, concrete blocks or scrap lumber shall not be used to support or level the scaffolds or planks.

The scaffold shall be erected as near as possible to the building or structure. All poles shall be set and maintained plumb for the full height of scaffold.

Guardrails and Toe boards

Open sides and ends of working levels 6 feet or more above grade shall be guarded by top rails, midrails and toe boards with a top railing at 42 inches above the platform level.

Where personnel are required to work or pass under scaffold, a screen (18 gage, ½ inch mesh or equivalent) shall be installed between top rail and toe board of platform guardrail.

Fabricated decking and planking – Manufactured platforms made of wood (including laminated wood and solid sawn wood planks), metal, or other materials.

Fabricated frame scaffold (tubular welded frame scaffold) – A scaffold consisting of a platform(s) supported on fabricated end frames with integral posts, horizontal bearers, and intermediate members.

Design Load

Scaffolds and their components shall be capable of supporting, without failure, at least four times the maximum intended load.

Access

A safe means of access such as a walkway, stair or fixed ladder shall be provided to all scaffold platforms. A portable ladder may be used if securely attached to the scaffold. Cross braces are never to be used for access to a scaffold.

All ladders shall extend three (3) feet minimum above the platform deck or twelve (12) inches above the top rail for handhold mounting and dismounting.

Planking and Overlapping

Wooden planking shall be scaffold grade as recognized by lumber industry standards.

Where planking is lapped, each plank shall lap its end supports a minimum (12) inches or be secured from movement. Overlapping of planks at the unsupported end or overhang of a plank is not permitted.

Where the ends of planks abut each other to form a flush floor, the abutted ends shall be secured to separate bearers. Where planks rest on bearers, end shall extend a minimum six (6) inches, but not more than maximum eighteen (18) inches over end supports.

Platform slopes shall not exceed two (2) inches in ten (10) feet.

Lifeline – A component consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline), or that connects to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

VIII. Tubular Steel Scaffolds

Material

Staging pieces such as poles, ledgers, bearers, ribbons, and braces shall be two (2) inch nominal O.D. tube steel or other material of an equivalent strength. All staging pieces shall extend a minimum ½ inch through the couplings to prevent the crimping of ends.

Bearers

Bearers shall be at least four (4) inches, but not more than twelve (12) inches longer than the pole spacing.

Height Limitations

Tubular steel scaffolds exceeding the maximum heights listed in specifications (Fig 7.4) shall be designed by a Civil Engineer registered within the appropriate jurisdiction.

Scaffolds shall not be built beyond reach of effective firefighting equipment.

Intermediate rest platforms shall be provided for climbing to levels where the change on elevation is greater than 30 feet. Rest (intermediate) platforms shall be fully planked, equipped with guardrail, midrails and toe board, and shall not be used for storage of material or as an additional work platform.

Securing

Staging shall be tied securely to structures or equipment to prevent tipping over. Ties shall be double 12 gage iron wire equivalent and not be spaced more than 30 feet horizontally or 26 feet vertically.

The ties should be close as possible to the top working platform.

“TCC” clamps with staging pieces may be used instead of tie-wires to stabilize staging.

STEEL SCAFFOLD SPECIFICATIONS

Tube and Coupler Scaffolds

Minimum size of Members

| | Light Duty | Medium Duty | Heavy Duty |
|-----------------------------------|--|---|---|
| Maximum intended load | 25 lbs/ft (2) | 50 lbs/ft(2) | 75 lbs/ft(2) |
| Posts, runners, and braces | Nominal 2 in. (1.90 inches) OD steel tube or pipe | Nominal 2 in. (1.90 inches) OD steel tube or pipe | Nominal 2 in. (1.90 inches) OD steel tube or pipe |
| Bearers | Nominal 2 in. (1.90 inches) OD steel tube or pipe And a maximum post spacing of 4' x 10' | Nominal 2 in. (1.90 inches) OD steel tube or pipe And a maximum post spacing of 4' x 7' Or Nominal 2 ½ in. (3.75 in.) OD steel tube Or pipe and a maximum post spacing of 6' x 8'(*) | Nominal 2 ½ in. (2.375 inches) OD steel tube or pipe and a maximum post Spacing of 6'x 6' |
| Maximum runner spacing vertically | 6' 6" | 6'6" | 6'6" |

* Bearers shall be installed in the direction of the shorter dimension.

Maximum Size of Planked Levels

| | Maximum number of additional planked levels | | | Maximum height of scaffold (in feet) |
|--------------------------|--|----------------|---------------|---|
| | Light Duty | Medium Duty | Heavy Duty | |
| Number of Working Levels | | | | |
| 1 | 16 | 11 | 6 | 125 |
| 2 | 11 | 1 | 0 | 125 |
| 3 | 6 | 0 | 0 | 125 |
| 4 | 1 | 0 | 0 | 125 |

IX. SCAFFOLD TAGGING PROCEDURES

J. J. White, Inc. carpenters and its designated contractors, will build, alter, dismantle and maintain all scaffolds on site. The employee or subcontractor who built the scaffold shall tag the scaffold, after erection, showing it is in compliance with OSHA regulations and our Scaffold Safety Program. Except for J. J. White, Inc. and its contractor's Scaffolding carpenters, no one is permitted to alter any scaffold for any reason. An alteration may require a change in tagging or create an unsafe condition.

All scaffolds shall be issued one of the following tags:

- a) **Green Tag** – Scaffold has been built to J. J. White, Incorporated and OSHA Standards. It meets OSHA's criteria for strength and fall protection. It has proper bracing, ribbons, ledgers, top rail and toe plate. No fall protection harness is required unless the person working leaves the scaffold decking or hangs outside the railing system and you lose the protection of the handrails.
- b) **Yellow Tag** – Scaffold is structurally sound but has a hazard associated with it. It may be the handrails were removed or a section of the planking is missing from the deck. This scaffold requires a fall protection harness with a lanyard to be working when on the deck when the scaffold is over 6'.
- c) **Red Tag** – Scaffold is being erected, modified or being dismantled. No one is to climb on or work from a red-tagged scaffold. A scaffold with No Tag is to be treated is to be treated as a Red Tagged Scaffold.



J. J. White, Inc.

Safety Training Program

**Scaffold User
Training Module**

By my signature below I acknowledge having received training on the topics listed.

Print Name _____

Sign Name _____

Craft _____

Date _____

Instructor _____

Last Four Digits of Employee's Social Security Number _____

J. J. White, Inc.

**Scaffold Safety Program
Release and Indemnity Agreement**

On this ____ day of _____, 20____, J. J. White, Inc. hereinafter referred to as “JJW” and _____, hereinafter referred to as “Contractor” agree as follows:

WHEREAS, Contractor is currently working at the above-mentioned building site and wishes to use the scaffolding, sling(s), elevator(s), tower(s), man-basket(s), or hoist(s) of which said scaffolding, sling(s), elevator(s), tower(s), man-basket(s) or hoist(s), JJW is the Owner, Operator or Lessee.

NOW, THEREFORE, the parties hereto in consideration of One (\$1.00) Dollar and other good and valuable consideration, intending to be legally bound, hereby have agreed as follows:

1. JJW will permit Contractor and its agents to use its scaffolding, sling(s), elevator(s), tower(s), man-basket(s), or hoist(s) from time to time and for such periods of time as JJW, in its sole discretion shall determine, so long as said scaffolding, sling(s), elevator(s), tower(s), man-basket(s) or hoist(s) shall remain at the aforesaid building site.
2. JJW makes no warranty, express or implied, with regard to the condition of the scaffolding, sling(s), elevator (s), tower(s), man-basket(s) or hoist(s) and makes no warranty, express or implied, that such scaffolding, sling(s), elevator(s), tower(s), man-basket(s) or hoist(s) is fit for any particular purpose whatsoever.
3. Contractor hereby releases and agrees to indemnify and hold harmless and defend JJW from and against any and all liability for loss, damage or expense which JJW may suffer, or for which JJW may be held liable by reason of injury, (including death) to any person including employees of the contractor or damage to my property arising out of the use, misuse, or abuse of the scaffolding, sling(s), elevator(s), tower(s), man-basket(s), or hoist(s) of JJW by any of Contractor’s agents, servants, workman, employees, invitees, business guests, licensees, officers, owners, shareholders, directors, subcontractors, material men, and/or suppliers, whether or not due in whole or in part to any act, omission or negligence of JJW or any of its representatives, employees, subcontractors or third parties, whether known or unknown to the contractor.

J. J. White, Inc.

**Scaffold Safety Program
Release and Indemnity Agreement**

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4. Contractor will provide JJW with a certificate of insurance issued by a company licensed to do business in the Commonwealth of Pennsylvania in which said site is located, insuring the insured against loss or liability for any of the above-mentioned happenings, with limits of not less than \$1,000,000.00 per person, and \$1,000,000.00 per occurrence, and \$1,000,000.00 property damage.
5. Contractor shall promptly notify JJW at 5500 Bingham Street, Philadelphia, PA 19120. (Or any other address designated by him in writing, at any time and from time to time), and said insurance company, as soon as it has knowledge of any inquiry relating to, or any injury or damage to and person and property and/or liability, injury, claims, damages, suits, and/or actions against Contractor and/or JJW as mentioned hereinabove, and all responses to such inquiries and the defense of any such claim shall be conducted by JJW and or the insured on its behalf and all expenses including, but not limited to, attorney's fees and disbursement incurred in defense of such claim shall be borne by the insurer or Contractor.
6. Notwithstanding any of the foregoing provisions, Contractor shall not use the scaffolding, sling(s), elevator(s), tower(s), man-basket(s), or hoist(s) which is the subject of this agreement until a certificate of insurance is provided to JJW in accordance with paragraph 4 of the Agreement and until JJW authorizes contractor in writing that it may use such scaffolding, sling(s), elevator(s), tower(s), man-basket(s) or hoist(s).

IN WITNESS WHEREOF, the parties hereto have set their hands and seals this day and year above mentioned.

J. J. White, Inc.

By: _____ **Title:** _____

Contractor

By: _____ **Title:** _____

J. J. White, Inc.

**Scaffold Safety Program
Release and Indemnity Agreement
Rider "A"**

Page 3 of 3

_____ will assume responsibility for physical damage to equipment which

_____ is using, as a result of _____'s use only.

Approximate value of the equipment (Scaffolding): \$_____.

J. J. White, Inc.

By: _____ **Title:** _____

Contractor

By: _____ **Title:** _____

APPENDIX 11

LIFTING TECHNOLOGIES, INC. MANBASKETS SAFETY HANBOOK

Lifting Technologies, Inc.

USE AND SAFETY HANDBOOK for SUSPENDED PERSONNEL PLATFORM

(MANBASKET)

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I. GENERAL

All procedures contained in this handbook are based on the use of the *Lifting Technologies Incorporated* Crane or Derrick Suspended Personnel Platform (hereinafter called *Lifting Technologies, Inc.* Manbasket, or the Manbasket), under proper operating conditions, with no deviation from original design intent, as per the Department of Labor Occupational Safety and Health Administration 29 CFR Part 1926.1501(g) (previously 29 CFR Part 1926.550(g)).

A thorough knowledge of the operating characteristics and limitations of the Manbasket is the first requirement for any user, regardless of his or her prior experience with similar types of equipment.

Important information is posted on the Data Plates, located on the bottom side of the upper guardrail of the Manbasket. They contain the Manbasket's serial number, gross weight, test weight, maximum occupancy, and its MAXIMUM RATED LOAD CAPACITY. DO NOT deface or cover this information.

Allow only authorized and qualified personnel, who have demonstrated that they understand the proper procedures and use of the Manbasket, to use it. (*Lifting Technologies Inc.* will provide training for an additional charge.)

ALWAYS inspect the Manbasket for deficiencies before use.

NEVER use a Manbasket that has deficiencies, damage, or unauthorized modifications.

Modifications to the Manbasket may only be performed after permission has been granted in writing from *Lifting Technologies Inc.* All requests for modifications must be submitted in writing to *Lifting Technologies Inc.*, P.O. Box 4167, Missoula, Montana 59806. Any modification or repair to the Manbasket must be performed by *Lifting Technologies Inc.* personnel. *Lifting Technologies Inc.* cannot be held responsible for any unauthorized modification or repair to the Manbasket.

If damage occurs during use, stop work immediately and proceed to safety.

The *Lifting Technologies Inc.* Manbasket is intended only for hoisting or lowering personnel and their tools to an otherwise inaccessible work area. The combined weight of personnel and tools **MUST NOT** exceed the rating as posted on the Identification Plate.

The *Lifting Technologies Inc.* Manbasket is designed for your safety. **DO NOT RISK YOUR LIFE BY USING THE MANBASKET WITH AN UNQUALIFIED CRANE OR DERRICK OPERATOR.**

Since safety of personnel and proper use of the Manbasket are of primary concern WARNINGS are inserted throughout this handbook. A WARNING is defined as follows: **If not correctly followed, could result in injury or death to personnel; or, if not strictly adhered to, could cause damage to or destruction of equipment.**

Some general DO's and DO NOT's are listed on page 2 and 3 and specific WARNINGS and cautions are listed on page 9.

II. DO...

Do wear a safety belt when occupying the Manbasket, with the lanyard attached preferably to the lower load block or overhaul ball or to a structural member within the Manbasket capable of supporting a fall impact. OSHA regulations require you to "tie on" when occupying a Manbasket except over water. When working over water, 1926.106 shall apply.

Do wear a hard hat.

Do perform a complete inspection of the Manbasket before each use.

Do be aware of any clearances required before initiating any crane function

EXAMPLE: OSHA requires a **MINIMUM** clearance of 10 feet from any live electrical line up to 50 KV.

Do understand all procedures before using the Manbasket.

Do perform the required lift/proof test, throughout the full range of the intended lift, every time the crane is set up.

Do use extreme caution at all times when using the Manbasket. Remember, crane manufacturers do not authorize the use of Manbaskets. A procedure for the use of Manbaskets has been outlined by OSHA and ANSI. Familiarize yourself with these documents before using the Manbasket. The use of a Manbasket must be the safest alternative to access the work.

III. DO NOT...

Do not use the Manbasket without first having the crane inspected by a qualified crane inspector.

Do not use a defective or damaged crane.

Do not use a defective or damaged Manbasket.

Do not breach the required clearance of a live electrical line.

Do not permit unauthorized personnel to use the Manbasket.

Do not allow personnel in the Manbasket with its test weight attached.

Do not permit persons to use this Manbasket who are not familiar with this handbook or with applicable OSHA and ANSI regulations concerning Manbaskets and cranes or derricks.

Do not attach test weight by any means other than that supplied by *Lifting Technologies Inc.*

Do not attach your safety belt lanyard to an adjacent structure when occupying the Manbasket.

Do not sit, stand, or climb on the Manbasket guard rail. Do not use boards, ladders, other devices, or extensions in the Manbaskets as a work position.

Do not use the Manbasket as a convenience. EXAMPLE: Do not use the Manbasket as an elevator if a stairway can be used.

Do not use the Manbasket if the Manbasket's permanent Data Plates are missing, defaced, or not legible.

Do not use a Manbasket that has not been first subjected to the required trial lift and proof test.

IV. DEPARTMENT OF LABOR AND OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION;
29 CFR 1926.1501

SCOPE, APPLICATION, AND DEFINITIONS

(g) Crane or derrick suspended personnel platforms—

(1) Scope, application and definitions—

(i) Scope and application. This standard applies to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on the load lines of cranes or derricks.

(ii) Definitions. For the purposes of this paragraph (g), the following definitions apply:

(A) Failure means load refusal, breakage, or separation of components.

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

(C) Load refusal means the point where the ultimate strength is exceeded.

(D) Maximum intended load means the total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

(E) Runway means a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.

(2) General requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

CRANE REQUIREMENTS

(3) Cranes and derricks—

(i) Operational criteria.

(A) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform.

(B) Load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten times the maximum intended load. The required design factor is achieved by taking the current safety factor of 3.5 (required under paragraph (b)(2)) of this section and applying the 50 per cent derating of the crane capacity which is required by paragraph (g)(3)(i)(F) of this section.

(C) Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position.

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

(E) The total weight of the loaded personnel platform and related rigging shall not exceed 50 percent of the rated capacity for the radius and configuration of the crane or derrick.

(F) The use of machines having live booms (booms in which lowering is controlled by a brake without aid from other devices which slow the lowering speeds) is prohibited.

(ii) *Instruments and components.*

(A) Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator.

(B) Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or an accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.

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

(D) The load line hoist drum shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering.) Free fall is prohibited.

PERSONNEL PLATFORMS

(4) *Personnel platforms—*

(i) *Design criteria.*

(A) The personnel platform and suspension system shall be designed by a qualified engineer or a qualified person competent in structural design.

(B) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

(C) The personnel platform itself, except the guardrail system and personal fall arrest system anchorages, shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load. Criteria for guardrail systems and personal fall arrest system anchorages are contained in subpart M of this Part.

(ii) Platform specifications.

- (A)** Each personnel platform shall be equipped with a guardrail system which meets the requirements of subpart M, and, shall be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than 1/2 inch (1.27 cm).
- (B)** A grab rail shall be installed inside the entire perimeter of the personnel platform.
- (C)** Access gates, if installed, shall not swing outward during hoisting.
- (D)** Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.
- (E)** Headroom shall be provided which allows employees to stand upright in the platform.
- (F)** In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.
- (G)** All rough edges exposed to contact by employees shall be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.
- (H)** All welding of the personnel platform and its components shall be performed by a qualified welder familiar with the weld grades, types and material specified in the platform design.
- (I)** The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

(iii) Personnel platform loading.

- (A)** The personnel platform shall not be loaded in excess of its rated load capacity. When a personnel platform does not have a rated load capacity then the personnel platform shall not be loaded in excess of its maximum intended load.
- (B)** The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.
- (C)** Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work, and shall not be used to hoist only materials or tools when not hoisting personnel.
- (D)** Materials and tools for use during a personnel lift shall be secured to prevent displacement.
- (E)** Materials and tools for use during a personnel lift shall be evenly distributed within the confines of the platform while the platform is suspended.

RIGGING

(iv) Rigging.

- (A)** When a wire rope bridle is used to connect the personnel platform to the load line, each bridle leg shall be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs.
- (B)** Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.
- (C)** Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting without failure at least ten times the maximum intended load.
- (D)** All eyes in wire rope slings shall be fabricated with thimbles.
- (E)** Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and shall not be used for any other purpose when not hoisting personnel.

TRIAL LIFT, INSPECTION AND PROOF TESTING

(5) Trial lift, inspection, and proof testing.

- (i)** A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls and safety devices are activated and functioning properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the 50 percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift can be loaded in the platform, as provided in paragraphs (g)(4)(iii) (D), and (E) of this section for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single set up position.
- (ii)** The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be repeated when the lift route is changed unless the operator determines that the route change is not significant (i.e. the route change would not affect the safety of hoisted employees.)
- (iii)** After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined to exist:

- (A)** Hoist ropes shall be free of kinks;
- (B)** Multiple part lines shall not be twisted around each other;
- (C)** The primary attachment shall be centered over the platform; and
- (D)** The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

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

(v) Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.

(vi) At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

WORK PRACTICES

(6) *Work practices.*

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

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

(iii) Tag lines shall be used unless their use creates an unsafe condition.

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

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

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

(vii) Except over water, employees occupying the personnel platform shall use a body belt/harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of

supporting a fall impact for employees using the anchorage. When working over water, the requirements of § [1926.106](#) shall apply.

(viii) No lifts shall be made on another of the crane's or derrick's loadlines while personnel are suspended on a platform.

TRAVELING

(7) Traveling.

(i) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and locomotive cranes, or where the employer demonstrates that there is no less hazardous way to perform the work.

(ii) Under any circumstances where a crane would travel while hoisting personnel, the employer shall implement the following procedures to safeguard employees:

(A) Crane travel shall be restricted to a fixed track or runway;

(B) Travel shall be limited to the load radius of the boom used during the lift; and

(C) The boom must be parallel to the direction of travel.

(D) A complete trial run shall be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by paragraph (g)(5)(i) of this section which tests the route of the lift.

(E) If travel is done with a rubber tired-carrier, the condition and air pressure of the tires shall be checked. The chart capacity for lifts on rubber shall be used for application of the 50 percent reduction of rated capacity. Notwithstanding paragraph (g)(3)(i)(E) of this section, outriggers may be partially retracted as necessary for travel.

PRE-LIFT MEETING

(8) Pre-lift meeting.

(i) A meeting attended by the crane or derrick operator, signal person(s) (if necessary) shall be held to review the appropriate requirements of paragraph (g) of this section and the procedures to be followed.

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

V. WARNINGS

WARNING: Never attempt to lengthen or shorten sling legs. Replace sling legs when damaged. Order replacement slings only from *Lifting Technologies, Inc.*

Keep area around eyebolts clear when lifting the Manbasket off of test weight.

Exercise extreme caution to prevent hoisting, swinging, or lowering into or onto any obstructions.

KNOW the weight of all persons and objects located in or attached to the Manbasket, and do not exceed rated capacity of the Manbasket.

KNOW the weight of all load handling devices such as the Manbasket (see Data Plates), load block, overhaul ball, jib and/or extension and make the proper deductions according to the crane manufacturer's load capacity chart. Do not exceed one-half the rated net load of the crane.

WARNING: It is not recommended that anyone, including but not limited to welding lead, air hose, oxygen-acetylene torch rubber, electrical line, etc., be attached to the Manbasket. However, if it should become necessary to do so, the weight **MUST BE KNOWN** and included in the weight that may be loaded into the Manbasket.

NOTE: Strict observance and execution of all procedures set forth in this handbook will better qualify personnel to perform in a safer, more professional manner; but it does not release users from the responsibility of obtaining, reading, and fully understanding the applicable OSHA regulations and ANSI standards regarding Manbaskets, cranes and derricks.

YOUR SAFETY IS AT STAKE!

It is impossible to compile a list of safety precautions covering all situations. However, there are basic safety precautions that **MUST** be followed during your daily routine. Safety is **YOUR** prime responsibility. This Manbasket can only be safe if it is used safely.

VI. WARRANTY

Lifting Technologies, Inc. warrants material and workmanship of its Manbasket for the period of twelve (12) months from the date of purchase, and this warranty is limited to the purchase price of the Manbasket. It is the responsibility of the owner of the Manbasket to instruct the user in all use and safety procedures. Abuse of the Manbasket is not considered under the warranty.

VII. DAILY INSPECTION CHECKLIST

A daily inspection for damage and defects must be performed each use of the Manbasket to hoist personnel. The inspection must be performed by a qualified person. The inspection must consist of, but not be limited to, the following items:

1. Master link
2. Slings
3. Sling eyes and swaged upper-end fitting
4. Swaged lower-end fittings
5. Cotter pins
6. Sling attachment points
7. Data plates
8. Frame
9. Top guardrail
10. Inner grab rail
11. Mid-rail
12. Access gate lock and hinges
13. Perforated panels
14. Floor grating
15. Toeboard
16. Test weight and eye bolts
17. Test weight attachment pins



APPENDIX 11

ATTACHMENT “A”

OSHA 29 CFR 1926.1431

Hoisting Personnel

NEW RULE EFFECTIVE NOVEMBER 8, 2010
OSHA 29 CFR Part 1926. 1431 Hoisting Personnel

Part Number, Title: 1926, Safety and Health Regulations for Construction
Subpart, Title: CC, Cranes & Derricks in Construction
Standard Number, Title: 1926.1431, Hoisting Personnel

The requirements of this section are supplemental to the other requirements in this subpart and apply when one or more employees are hoisted.

1926.1431(a)

The use of equipment to hoist employees is prohibited except where the employer demonstrates that the erection, use, and dismantling of conventional means of reaching the work area, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous, or is not possible because of the project's structural design or worksite conditions. This paragraph does not apply to work covered by subpart R (Steel Erection) of this part.

1926.1431(b)

Use of personnel platform.

1926.1431(b)(1)

When using equipment to hoist employees, the employees must be in a personnel platform that meets the requirements of paragraph (e) of this section.

1926.1431(b)(2)

Exceptions: A personnel platform is not required for hoisting employees:

1926.1431(b)(2)(i)

Into and out of drill shafts that are up to and including 8 feet in diameter (*see* paragraph (o) of this section for requirements for hoisting these employees).

1926.1431(b)(2)(ii)

In pile driving operations (*see* paragraph (p) of this section for requirements for hoisting these employees).

1926.1431(b)(2)(iii)

Solely for transfer to or from a marine worksite in a marine-hoisted personnel transfer device (*see* paragraph (r) of this section for requirements for hoisting these employees).

1926.1431(b)(2)(iv)

In storage-tank (steel or concrete), shaft and chimney operations (*see* paragraph (s) of this section for requirements for hoisting these employees).

1926.1431(c)

Equipment set-up.

1926.1431(c)(1)

The equipment must be uniformly level, within one percent of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable.

1926.1431(c)(2)

Equipment with outriggers or stabilizers must have them all extended and locked. The amount of extension must be the same for all outriggers and stabilizers and in accordance with manufacturer procedures and load charts.

1926.1431(d)

Equipment criteria.

1926.1431(d)(1)

Capacity: Use of suspended personnel platforms. The total load (with the platform loaded, including the hook, load line and rigging) must not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.

1926.1431(d)(2)

Capacity: Use of boom-attached personnel platforms. The total weight of the loaded personnel platform must not exceed 50 percent of the rated capacity for the radius and configuration of the equipment (except during proof testing).

1926.1431(d)(3)

Capacity: Hoisting personnel without a personnel platform. When hoisting personnel without a personnel platform pursuant to paragraph (b)(2) of this section, the total load (including the hook, load line, rigging and any other equipment that imposes a load) must not exceed 50 percent of the rated capacity for the radius and

configuration of the equipment, except during proof testing.

1926.1431(d)(4)

When the occupied personnel platform is in a stationary working position, the load and boom hoist brakes, swing brakes, and operator actuated secondary braking and locking features (such as pawls or dogs) or automatic secondary brakes must be engaged.

1926.1431(d)(5)

Devices.

1926.1431(d)(5)(i)

Equipment (except for derricks and articulating cranes) with a variable angle boom must be equipped with all of the following:

1926.1431(d)(5)(i)(A)

A boom angle indicator, readily visible to the operator, and

1926.1431(d)(5)(i)(B)

A boom hoist limiting device.

1926.1431(d)(5)(ii)

Articulating cranes must be equipped with a properly functioning automatic overload protection device.

1926.1431(d)(5)(iii)

Equipment with a luffing jib must be equipped with:

1926.1431(d)(5)(iii)(A)

A jib angle indicator, readily visible to the operator, and.

1926.1431(d)(5)(iii)(B)

A jib hoist limiting device.

1926.1431(d)(5)(iv)

Equipment with telescoping booms must be equipped with a device to indicate the boom's extended length clearly to the operator, or must have measuring marks on the boom.

1926.1431(d)(5)(v)

Anti two-block. 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) must be used. The device(s) must prevent such damage/failure at all points where two-blocking could occur. *Exception:* This device is not required when hoisting personnel in pile driving operations. Instead, paragraph (p)(2) of this section specifies how to prevent two-blocking during such operations.

1926.1431(d)(5)(vi)

Controlled load lowering. The load line hoist drum must have a system, other than the load line hoist brake, which regulates the lowering rate of speed of the hoist mechanism. This system or device must be used when hoisting personnel.

Note: Free fall of the load line hoist is prohibited (see § 1926.1426(d); the use of equipment in which the boom

hoist mechanism can free fall is also prohibited (see § 1926.1426(a)(1).

1926.1431(d)(5)(vii)

Proper operation required. Personnel hoisting operations must not begin unless the devices listed in this section are in proper working order. If a device stops working properly during such operations, the operator must safely stop operations. Personnel hoisting operations must not resume until the device is again working properly.

Alternative measures are not permitted. (See § 1926.1417 for tag-out and related requirements.)

1926.1431(d)(6)

Direct attachment of a personnel platform to a luffing jib is prohibited.

1926.1431(e)

Personnel platform criteria.

1926.1431(e)(1)

A qualified person familiar with structural design must design the personnel platform and attachment/suspension system used for hoisting personnel.

1926.1431(e)(2)

The system used to connect the personnel platform to the equipment must allow the platform to remain within 10 degrees of level, regardless of boom angle.

1926.1431(e)(3)

The suspension system must be designed to minimize tipping of the platform due to movement of employees occupying the platform.

1926.1431(e)(4)

The personnel platform itself (excluding the guardrail system and personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load.

1926.1431(e)(5)

All welding of the personnel platform and its components must be performed by a certified welder familiar with the weld grades, types and material specified in the platform design.

1926.1431(e)(6)

The personnel platform must be equipped with a guardrail system which meets the requirements of subpart M of this part, and must be enclosed at least from the toeboard to mid-rail with either solid construction material or expanded metal having openings no greater than ½ inch (1.27 cm). Points to which personal fall arrest systems are attached must meet the anchorage requirements in subpart M of this part.

1926.1431(e)(7)

A grab rail must be installed inside the entire perimeter of the personnel platform except for access gates/doors.

1926.1431(e)(8)

Access gates/doors. If installed, access gates/doors of all types (including swinging, sliding, folding, or other types) must:

1926.1431(e)(8)(i)

Not swing outward. If due to the size of the personnel platform, such as a 1-person platform, it is infeasible for the door to swing inward and allow safe entry for the platform occupant, then the access gate/door may swing outward.

1926.1431(e)(8)(ii)

Be equipped with a device that prevents accidental opening.

1926.1431(e)(9)

Headroom must be sufficient to allow employees to stand upright in the platform.

1926.1431(e)(10)

In addition to the use of hard hats, employees must be protected by overhead protection on the personnel platform when employees are exposed to falling objects. The platform overhead protection must not obscure the view of the operator or platform occupants (such as wire mesh that has up to ½ inch openings), unless full protection is necessary.

1926.1431(e)(11)

All edges exposed to employee contact must be smooth enough to prevent injury.

1926.1431(e)(12)

The weight of the platform and its rated capacity must be conspicuously posted on the platform with a plate or other permanent marking.

1926.1431(f)

Personnel platform loading.

1926.1431(f)(1)

The personnel platform must not be loaded in excess of its rated capacity.

1926.1431(f)(2)

Use.

1926.1431(f)(2)(i)

Personnel platforms must be used only for employees, their tools, and the materials necessary to do their work. Platforms must not be used to hoist materials or tools when not hoisting personnel.

1926.1431(f)(2)(ii)

Exception: Materials and tools to be used during the lift, if secured and distributed in accordance with paragraph (f)(3) of this section may be in the platform for trial lifts.

1926.1431(f)(3)

Materials and tools must be:

1926.1431(f)(3)(i)

Secured to prevent displacement.

1926.1431(f)(3)(ii)

Evenly distributed within the confines of the platform while it is suspended.

1926.1431(f)(4)

The number of employees occupying the personnel platform must not exceed the maximum number the platform was designed to hold or the number required to perform the work, whichever is less.

1926.1431(g)

Attachment and rigging.

1926.1431(g)(1)

Hooks and other detachable devices.

1926.1431(g)(1)(i)

Hooks used in the connection between the hoist line and the personnel platform (including hooks on overhaul ball assemblies, lower load blocks, bridle legs, or other attachment assemblies or components) must be:

1926.1431(g)(1)(i)(A)

Of a type that can be closed and locked, eliminating the throat opening.

1926.1431(g)(1)(i)(B)

Closed and locked when attached.

1926.1431(g)(1)(ii)

Shackles used in place of hooks must be of the alloy anchor type, with either:

1926.1431(g)(1)(ii)(A)

A bolt, nut and retaining pin, in place; or

1926.1431(g)(1)(ii)(B)

Of the screw type, with the screw pin secured from accidental removal.

1926.1431(g)(1)(iii)

Where other detachable devices are used, they must be of the type that can be closed and locked to the same extent as the devices addressed in paragraphs (g)(1)(i) and (ii) of this section. Such devices must be closed and locked when attached.

1926.1431(g)(2)

Rope bridle. When a rope bridle is used to suspend the personnel platform, each bridle leg must be connected to a master link or shackle (see paragraph (g)(1) of this section) in a manner that ensures that the load is evenly divided among the bridle legs.

1926.1431(g)(3)

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

1926.1431(g)(4)

Eyes in wire rope slings must be fabricated with thimbles.

1926.1431(g)(5)

Bridles and associated rigging for suspending the personnel platform must be used only for the platform and the necessary employees, their tools and materials necessary to do their work. The bridles and associated rigging must not have been used for any purpose other than hoisting personnel.

1926.1431(h)

Trial lift and inspection.

1926.1431(h)(1)

A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight must be made from ground level, or any other location where employees will enter the platform, to each location at which the platform is to be hoisted and positioned. Where there is more than one location to be reached from a single set-up position, either individual trial lifts for each location, or a single trial lift, in which the platform is moved sequentially to each location, must be performed; the method selected must be the same as the method that will be used to hoist the personnel.

1926.1431(h)(2)

The trial lift must be performed immediately prior to each shift in which personnel will be hoisted. In addition, the trial lift must be repeated prior to hoisting employees in each of the following circumstances:

1926.1431(h)(2)(i)

The equipment is moved and set up in a new location or returned to a previously used location.

1926.1431(h)(2)(ii)

The lift route is changed, unless the competent person determines that the new route presents no new factors affecting safety.

1926.1431(h)(3)

The competent person must determine that:

1926.1431(h)(3)(i)

Safety devices and operational aids required by this section are activated and functioning properly. Other safety devices and operational aids must meet the requirements of § 1926.1415 and § 1926.1416.

1926.1431(h)(3)(ii)

Nothing interferes with the equipment or the personnel platform in the course of the trial lift.

1926.1431(h)(3)(iii)

The lift will not exceed 50 percent of the equipment's rated capacity at any time during the lift.

1926.1431(h)(3)(iv)

The load radius to be used during the lift has been accurately determined.

1926.1431(h)(4)

Immediately after the trial lift, the competent person must:

1926.1431(h)(4)(i)

Conduct a visual inspection of the equipment, base support or ground, and personnel platform, to determine whether the trial lift has exposed any defect or problem or produced any adverse effect.

1926.1431(h)(4)(ii)

Confirm that, upon the completion of the trial lift process, the test weight has been removed.

1926.1431(h)(5)

Immediately prior to each lift:

1926.1431(h)(5)(i)

The platform must be hoisted a few inches with the personnel and materials/tools on board and inspected by a competent person to ensure that it is secure and properly balanced.

1926.1431(h)(5)(ii)

The following conditions must be determined by a competent person to exist before the lift of personnel proceeds:

1926.1431(h)(5)(ii)(A)

Hoist ropes must be free of deficiencies in accordance with § 1926.1413(a).

1926.1431(h)(5)(ii)(B)

Multiple part lines must not be twisted around each other.

1926.1431(h)(5)(ii)(C)

The primary attachment must be centered over the platform.

1926.1431(h)(5)(ii)(D)

If the load rope is slack, the hoisting system must be inspected to ensure that all ropes are properly seated on drums and in sheaves.

1926.1431(h)(6)

Any condition found during the trial lift and subsequent inspection(s) that fails to meet a requirement of this standard or otherwise creates a safety hazard must be corrected before hoisting personnel. (See § 1926.1417 for tag-out and related requirements.)

1926.1431(i)

[Reserved.]

1926.1431(j)

Proof testing.

1926.1431(j)(1)

At each jobsite, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging must be proof tested to 125 percent of the platform's rated capacity. The proof test may be done concurrently with the trial lift.

1926.1431(j)(2)

The platform must be lowered by controlled load lowering, braked, and held in a suspended position for a minimum of five minutes with the test load evenly distributed on the platform.

1926.1431(j)(3)

After proof testing, a competent person must inspect the platform and rigging to determine if the test has been passed. If any deficiencies are found that pose a safety hazard, the platform and rigging must not be used to hoist personnel unless the deficiencies are corrected, the test is repeated, and a competent person determines that the test has been passed. (See § 1926.1417 for tag-out and related requirements.)

1926.1431(j)(4)

Personnel hoisting must not be conducted until the competent person determines that the platform and rigging have successfully passed the proof test.

1926.1431(k)

Work practices.

1926.1431(k)(1)

Hoisting of the personnel platform must be performed in a slow, controlled, cautious manner, with no sudden movements of the equipment or the platform.

1926.1431(k)(2)

Platform occupants must:

1926.1431(k)(2)(i)

Keep all parts of the body inside the platform during raising, lowering, and horizontal movement. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person.

1926.1431(k)(2)(ii)

Not stand, sit on, or work from the top or intermediate rail or toeboard, or use any other means/device to raise their working height.

1926.1431(k)(2)(iii)

Not pull the platform out of plumb in relation to the hoisting equipment.

1926.1431(k)(3)

Before employees exit or enter a hoisted personnel platform that is not landed, the platform must be secured to the structure where the work is to be performed, unless the employer can demonstrate that securing to the structure would create a greater hazard.

1926.1431(k)(4)

If the platform is tied to the structure, the operator must not move the platform until the operator receives confirmation that it is freely suspended.

1926.1431(k)(5)

Tag lines must be used when necessary to control the platform.

1926.1431(k)(6)

Platforms without controls. Where the platform is not equipped with controls, the equipment operator must remain at the equipment controls, on site, and in view of the equipment, at all times while the platform is occupied.

1926.1431(k)(7)

Platforms with controls. Where the platform is equipped with controls, all of the following must be met at all times while the platform is occupied:

1926.1431(k)(7)(i)

The occupant using the controls in the platform must be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation.

1926.1431(k)(7)(ii)

The equipment operator must be at a set of equipment controls that include boom and swing functions of the equipment, and must be on site and in view of the equipment.

1926.1431(k)(7)(iii)

The platform operating manual must be in the platform or on the equipment.

1926.1431(k)(8)

Environmental conditions.

1926.1431(k)(8)(i)

Wind. When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a qualified person must determine if, in light of the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated).

1926.1431(k)(8)(ii)

Other weather and environmental conditions. A qualified person must determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated).

1926.1431(k)(9)

Employees being hoisted must remain in direct communication with the signal person (where used), or the operator.

1926.1431(k)(10)

Fall protection.

1926.1431(k)(10)(i)

Except over water, employees occupying the personnel platform must be provided and use a personal fall arrest system. The system must be attached to a structural member within the personnel platform. When working over or near water, the requirements of § 1926.106 apply.

1926.1431(k)(10)(ii)

The fall arrest system, including the attachment point (anchorage) used to comply with paragraph (i) of this section, must meet the requirements in § 1926.502.

1926.1431(k)(11)

Other load lines.

1926.1431(k)(11)(i)

No lifts must be made on any other of the equipment's load lines while personnel are being hoisted, except in pile driving operations.

1926.1431(k)(11)(ii)

Factory-produced boom-mounted personnel platforms that incorporate a winch as original equipment. Loads are permitted to be hoisted by such a winch while employees occupy the personnel platform only where the load on the winch line does not exceed 500 pounds and does not exceed the rated capacity of the winch and platform.

1926.1431(k)(12)

Traveling--equipment other than derricks.

1926.1431(k)(12)(i)

Hoisting of employees while the equipment is traveling is prohibited, except for:

1926.1431(k)(12)(i)(A)

Equipment that travels on fixed rails; or

1926.1431(k)(12)(i)(B)

Where the employer demonstrates that there is no less hazardous way to perform the work.

1926.1431(k)(12)(i)(C)

This exception does not apply to rubber-tired equipment.

1926.1431(k)(12)(ii)

Where employees are hoisted while the equipment is traveling, all of the following criteria must be met:

1926.1431(k)(12)(ii)(A)

Equipment travel must be restricted to a fixed track or runway.

1926.1431(k)(12)(ii)(B)

Where a runway is used, it must be a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the equipment being used to lift and travel with the personnel platform. An existing surface may be used as long as it meets these criteria.

1926.1431(k)(12)(ii)(C)

Equipment travel must be limited to boom length.

1926.1431(k)(12)(ii)(D)

The boom must be parallel to the direction of travel, except where it is safer to do otherwise.

1926.1431(k)(12)(ii)(E)

A complete trial run must be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by paragraph (h) of this section which tests the lift route.

1926.1431(k)(13)

Traveling--derricks. Derricks are prohibited from traveling while personnel are hoisted.

1926.1431(l)

[Reserved.]

1926.1431(m)

Pre-lift meeting. A pre-lift meeting must be:

1926.1431(m)(1)

Held to review the applicable requirements of this section and the procedures that will be followed.

1926.1431(m)(2)

Attended by the equipment operator, signal person (if used for the lift), employees to be hoisted, and the person responsible for the task to be performed.

1926.1431(m)(3)

Held prior to the trial lift at each new work location, and must be repeated for any employees newly assigned to the operation.

1926.1431(n)

Hoisting personnel near power lines. Hoisting personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited, except for work covered by subpart V of this part (Power Transmission and Distribution).

1926.1431(o)

Hoisting personnel in drill shafts. When hoisting employees into and out of drill shafts that are up to and including 8 feet in diameter, all of the following requirements must be met:

1926.1431(o)(1)

The employee must be in either a personnel platform or on a boatswain's chair.

1926.1431(o)(2)

If using a personnel platform, paragraphs (a) through (n) of this section apply.

1926.1431(o)(3)

If using a boatswain's chair:

1926.1431(o)(3)(i)

The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, substitute them with "boatswain's chair."

1926.1431(o)(3)(ii)

A signal person must be stationed at the shaft opening.

1926.1431(o)(3)(iii)

The employee must be hoisted in a slow, controlled descent and ascent.

1926.1431(o)(3)(iv)

The employee must use personal fall protection equipment, including a full body harness, attached independent of the crane/derrick.

1926.1431(o)(3)(v)

The fall protection equipment must meet the applicable requirements in § 1926.502.

1926.1431(o)(3)(vi)

The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load.

1926.1431(o)(3)(vii)

No more than one person must be hoisted at a time.

1926.1431(p)

Hoisting personnel for pile driving operations. When hoisting an employee in pile driving operations, the following requirements must be met:

1926.1431(p)(1)

The employee must be in a personnel platform or boatswain's chair.

1926.1431(p)(2)

For lattice boom cranes: 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 who is in direct communication with the operator to inform the operator when this point is reached. For telescopic boom cranes: Clearly mark the cable (so that it can be easily 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 who is in direct communication with the operator to inform the operator when this point is reached.

1926.1431(p)(3)

If using a personnel platform, paragraphs (b) through (n) of this section apply.

1926.1431(p)(4)

If using a boatswain's chair:

1926.1431(p)(4)(i)

The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (j), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), and (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, substitute them with "boatswain's chair."

1926.1431(p)(4)(ii)

The employee must be hoisted in a slow, controlled descent and ascent.

1926.1431(p)(4)(iii)

The employee must use personal fall protection equipment, including a full body harness, independently attached to the lower load block or overhaul ball.

1926.1431(p)(4)(iv)

The fall protection equipment must meet the applicable requirements in § 1926.502.

1926.1431(p)(4)(v)

The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load.

1926.1431(p)(4)(vi)

No more than one person must be hoisted at a time.

1926.1431(q)

[Reserved.]

1926.1431(r)

Hoisting personnel for marine transfer. When hoisting employees solely for transfer to or from a marine worksite, the following requirements must be met:

1926.1431(r)(1)

The employee must be in either a personnel platform or a marine-hoisted personnel transfer device.

1926.1431(r)(2)

If using a personnel platform, paragraphs (a) through (n) of this section apply.

1926.1431(r)(3)

If using a marine-hoisted personnel transfer device:

1926.1431(r)(3)(i)

The following paragraphs of this section apply: (a), (c)(2), (d)(1), (d)(3), (d)(4), (e)(1) through (5), (e)(12), (f)(1), (g), (h), (j), (k)(1), (k)(8), (k)(9), (k)(10)(ii), (k)(11)(i), (k)(12), (m), and (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, substitute them with "marine-hoisted personnel transfer device."

1926.1431(r)(3)(ii)

The transfer device must be used only for transferring workers.

1926.1431(r)(3)(iii)

The number of workers occupying the transfer device must not exceed the maximum number it was designed to hold.

1926.1431(r)(3)(iv)

Each employee must wear a U.S. Coast Guard personal flotation device approved for industrial use.

1926.1431(s)

Hoisting personnel for storage-tank (steel or concrete), shaft and chimney operations. When hoisting an employee in storage tank (steel or concrete), shaft and chimney operations, the following requirements must be met:

1926.1431(s)(1)

The employee must be in a personnel platform except when the employer can demonstrate that use of a personnel platform is infeasible; in such a case, a boatswain's chair must be used.

1926.1431(s)(2)

If using a personnel platform, paragraphs (a) through (n) of this section apply.

1926.1431(s)(3)

If using a boatswain's chair:

1926.1431(s)(3)(i)

The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, substitute them with "boatswains chair."

1926.1431(s)(3)(ii)

The employee must be hoisted in a slow, controlled descent and ascent.

1926.1431(s)(3)(iii)

The employee must use personal fall protection equipment, including a full body harness, attached independent of the crane/derrick. When there is no adequate structure for attachment of personal fall arrest equipment as required in § 1926.502(d)(15), the attachment must be to the lower load block or overhaul ball.

1926.1431(s)(3)(iv)

The fall protection equipment must meet the applicable requirements in § 1926.502.

1926.1431(s)(3)(v)

The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load.

1926.1431(s)(3)(vi)

No more than one person must be hoisted at a time.

[75 FR 48159, August 9, 2010]

APPENDIX 12

OSHA CONSTRUCTION STANDARD FOR EXCAVATIONS



J. J. White, Inc.

Subpart P - Excavations

AUTHORITY: Sec. 107, Contract Worker Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs, 4, 6, 8; Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR 25059), or 9-83 (48 FR 35736), as applicable, and 29 CFR part 1911. **SOURCE:** 54 FR 45959, Oct. 31, 1989, unless otherwise noted.

29 CFR 1926.650 SCOPE, APPLICATION, AND DEFINITIONS APPLICABLE TO THIS SUBPART.

1926.650(a) Scope and application. This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

1926.650(b) Definitions applicable to this subpart.

"Accepted engineering practices" means those requirements which are compatible with standards of practice required by a registered professional engineer.

"Aluminum Hydraulic Shoring" means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

"Bell-bottom pier hole" means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

"Benching (Benching system)" means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

"Cave-in" means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

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

"Cross braces" mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

Excavation means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Faces or sides means the vertical or inclined earth surfaces formed as a result of excavation work.

Failure means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Hazardous atmosphere means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

Kickout means the accidental release or failure of a cross brace.

Protective system means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Ramp means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

Registered Professional Engineer means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

Sheeting means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield system) means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in

accordance with § 1926.652 (c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring (Shoring system) means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sides. See "Faces."

Sloping (Sloping system) means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Stable rock means natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Structural ramp means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

Support system means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated data means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Trench (Trench excavation) means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less

(measured at the bottom of the excavation), the excavation is also considered to be a trench.

Trench box. See "Shield."

Trench shield. See "Shield."

Uprights means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

Wales means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

§ 1926.651 Specific excavation requirements.

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

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

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

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

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

(c) *Access and egress*—(1) *Structural ramps.* (i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

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

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

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

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

(2) *Means of egress from trench excavations.* A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

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

(e) *Exposure to falling loads.* No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with § 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

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

(g) *Hazardous atmospheres—(1) Testing and controls.* In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50-1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

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

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

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

(2) *Emergency rescue equipment.* (i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous at-

mospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

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

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

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

(3) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)(2) of this section.

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

(2) Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably

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expected to pose a hazard to employees shall not be permitted except when:

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

(ii) The excavation is in stable rock; or

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

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

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

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

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

(k) *Inspections.* (1) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout

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the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

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

(i) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with § 1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

[54 FR 45959, Oct. 31, 1989, as amended by 59 FR 40730, Aug. 9, 1994]

§ 1926.652 Requirements for protective systems.

(a) *Protection of employees in excavations.* (1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:

(i) Excavations are made entirely in stable rock; or

(ii) Excavations are less than 5 feet (1.52m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

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

(b) *Design of sloping and benching systems.* The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(1); or, in the alternative, paragraph (b)(2); or, in the alternative, paragraph (b)(3), or, in the alternative, paragraph (b)(4), as follows:

(1) *Option (1)—Allowable configurations and slopes.* (i) Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical

(34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

(ii) Slopes specified in paragraph (b)(1)(i) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.

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

(3) *Option (3)—Designs using other tabulated data.* (i) Designs of sloping or benching systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

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

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

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

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

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

(4) *Option (4)—Design by a registered professional engineer.* (i) Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.

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

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

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

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

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

(c) *Design of support systems, shield systems, and other protective systems.* Designs of support systems shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, in the alternative, paragraph (c)(4) as follows:

(1) *Option (1)—Designs using appendices A, C and D.* Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

(2) *Option (2)—Designs Using Manufacturer's Tabulated Data.* (i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

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

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

be made available to the Secretary upon request.

(3) *Option (3)—Designs using other tabulated data.* (i) Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

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

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

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

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

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

(4) *Option (4)—Design by a registered professional engineer.* (i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

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

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

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

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

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

(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a man-

ner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

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

(e) *Installation and removal of support—(1) General.* (i) Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

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

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

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

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

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

(2) *Additional requirements for support systems for trench excavations.* (i) Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and

there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

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

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

(g) *Shield systems—(1) General.* (i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

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

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

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

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

APPENDIX A TO SUBPART P OF PART 1926—SOIL CLASSIFICATION

(a) *Scope and application—(1) Scope.* This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

(2) *Application.* This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in §1926.652(b)(2) as a method of protection for employees from cave-ins. This appendix also applies when timber shoring for excavations is designed as a method of protection from cave-ins in accordance with appendix C

to subpart P of part 1926, and when aluminum hydraulic shoring is designed in accordance with appendix D. This Appendix also applies if other protective systems are designed and selected for use from data prepared in accordance with the requirements set forth in §1926.652(c), and the use of the data is predicated on the use of the soil classification system set forth in this appendix.

(b) *Definitions.* The definitions and examples given below are based on, in whole or in part, the following: American Society for Testing Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification System, The U.S. Department of Agriculture (USDA) Textural Classification Scheme; and The National Bureau of Standards Report BSS-121.

Cemented soil means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

Cohesive soil means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

Dry soil means soil that does not exhibit visible signs of moisture content.

Fissured means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

Granular soil means gravel, sand, or silt, (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

Layered system means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

Moist soil means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

Plastic means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

Saturated soil means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or shear vane.

Soil classification system means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions of exposure.

Stable rock means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Submerged soil means soil which is underwater or is free seeping.

Type A means cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

- (i) The soil is fissured; or
- (ii) The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
- (iii) The soil has been previously disturbed; or
- (iv) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
- (v) The material is subject to other factors that would require it to be classified as a less stable material.

Type B means:

- (i) Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
- (ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
- (iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.
- (iv) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or
- (v) Dry rock that is not stable; or
- (vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

Type C means:

- (i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
- (ii) Granular soils including gravel, sand, and loamy sand; or
- (iii) Submerged soil or soil from which water is freely seeping; or
- (iv) Submerged rock that is not stable, or

- (v) Material in a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or steeper.

Unconfined compressive strength means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

Wet soil means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

(c) *Requirements*—(1) *Classification of soil and rock deposits*. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.

(2) *Basis of classification*. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

(3) *Visual and manual analyses*. The visual and manual analyses, such as those noted as being acceptable in paragraph (d) of this appendix, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(4) *Layered systems*. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

(5) *Reclassification*. If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person. The deposit shall be reclassified as necessary to reflect the changed circumstances.

(d) *Acceptable visual and manual tests*—(1) *Visual tests*. Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(i) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained

material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

(ii) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

(iii) Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

(iv) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

(v) Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.

(vi) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

(vii) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

(2) *Manual tests.* Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(i) *Plasticity.* Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.

(ii) *Dry strength.* If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

(iii) *Thumb penetration.* The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard

designation D2488—"Standard Recommended Practice for Description of Soils (Visual—Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(iv) *Other strength tests.* Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.

(v) *Drying test.* The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:

(A) If the sample develops cracks as it dries, significant fissures are indicated.

(B) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as a unfissured cohesive material and the unconfined compressive strength should be determined.

(C) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

APPENDIX B TO SUBPART P OF PART 1926—SLOPING AND BENCHING

(a) *Scope and application.* This appendix contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in §1926.652(b)(2).

(b) *Definitions.*

Actual slope means the slope to which an excavation face is excavated.

Distress means that the soil is in a condition where a cave-in is imminent or is likely

to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and raveling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and trickling or rolling down into the excavation.

Maximum allowable slope means the steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

Short term exposure means a period of time less than or equal to 24 hours that an excavation is open.

(c) *Requirements*—(1) *Soil classification*. Soil and rock deposits shall be classified in accordance with appendix A to subpart P of part 1926.

(2) *Maximum allowable slope*. The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of this appendix.

(3) *Actual slope*. (i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least $\frac{1}{2}$ horizontal to one vertical ($\frac{1}{2}$ H:1V) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with §1926.651(i).

(4) *Configurations*. Configurations of sloping and benching systems shall be in accordance with Figure B-1.

TABLE B-1
MAXIMUM ALLOWABLE SLOPES

| SOIL OR ROCK TYPE | MAXIMUM ALLOWABLE SLOPES (H:V) [1] FOR EXCAVATIONS LESS THAN 20 FEET DEEP [3] |
|-------------------|---|
| STABLE ROCK | VERTICAL (90°) |
| TYPE A [2] | 3/4 : 1 (53°) |
| TYPE B | 1:1 (45°) |
| TYPE C | 1½ : 1 (34°) |

NOTES:

- Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.
- A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).
- Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

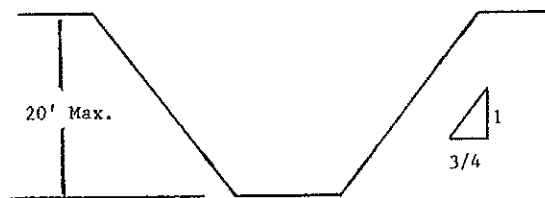
Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

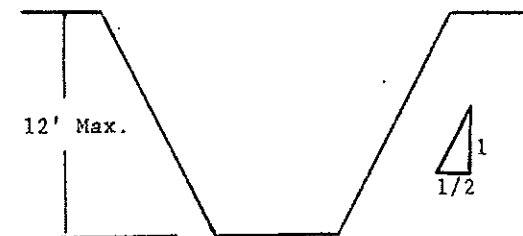
B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of $\frac{3}{4}$:1.



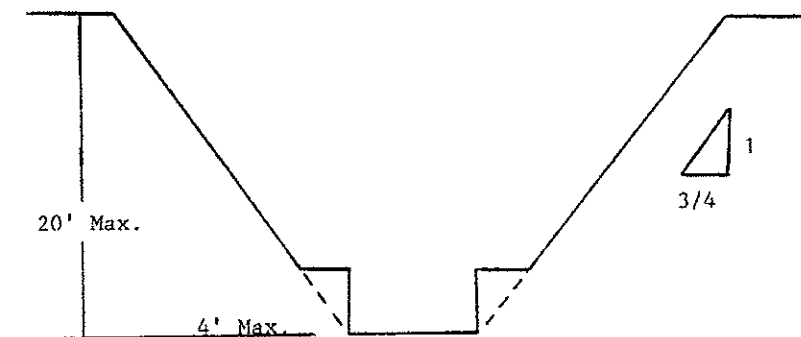
SIMPLE SLOPE—GENERAL

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of $\frac{1}{2}$:1.

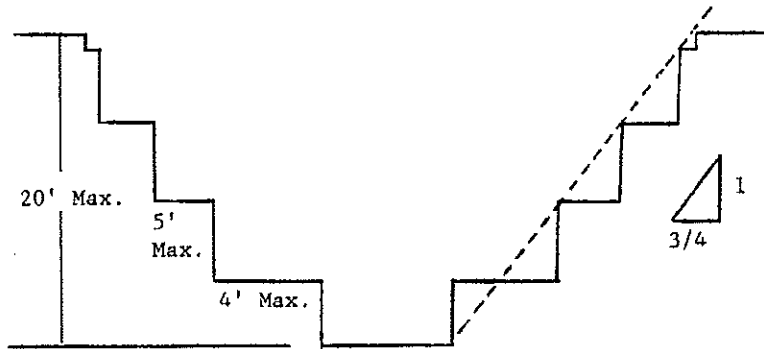


SIMPLE SLOPE—SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of $\frac{3}{4}$ to 1 and maximum bench dimensions as follows:

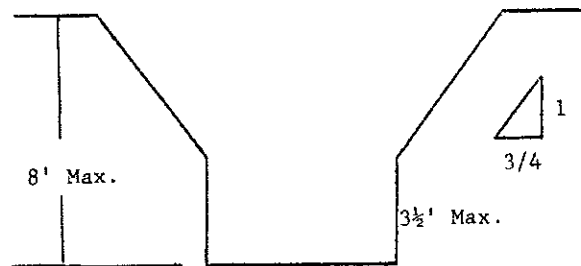


SIMPLE BENCH



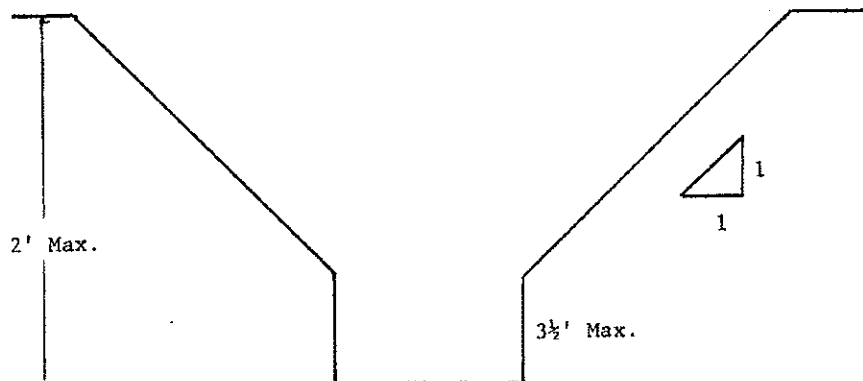
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



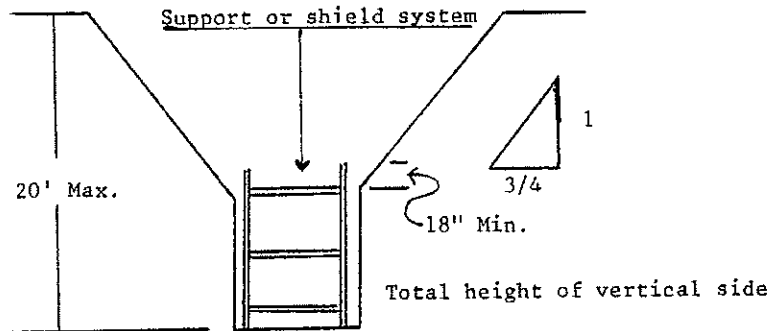
UNSUPPORTED VERTICALLY SIDED LOWER PORTION—MAXIMUM 8 FEET IN DEPTH

All excavations more than 8 feet but not more than 12 feet in depth which unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION—MAXIMUM 12 FEET IN DEPTH

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of $\frac{3}{4}$:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

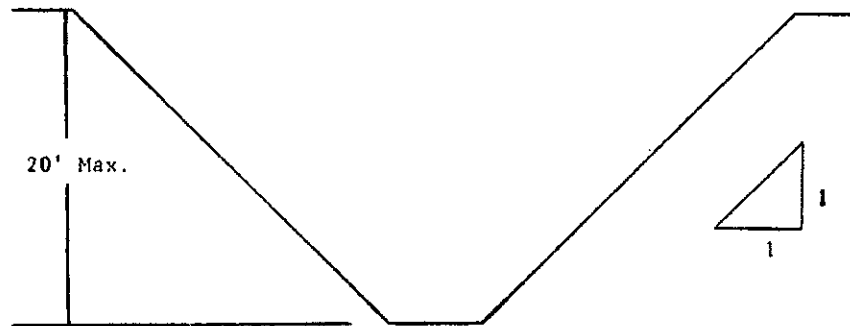


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under §1926.652(b).

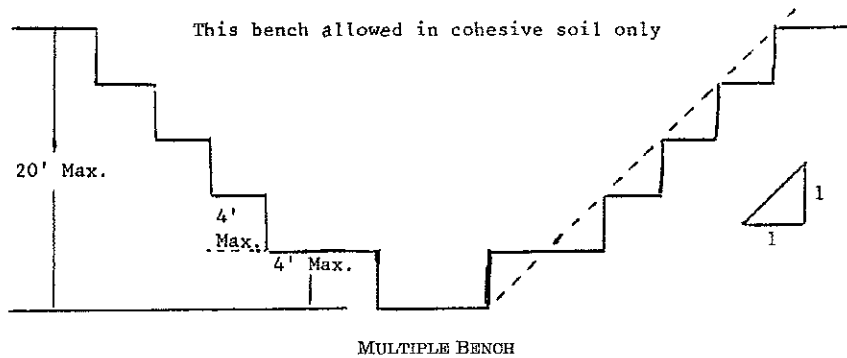
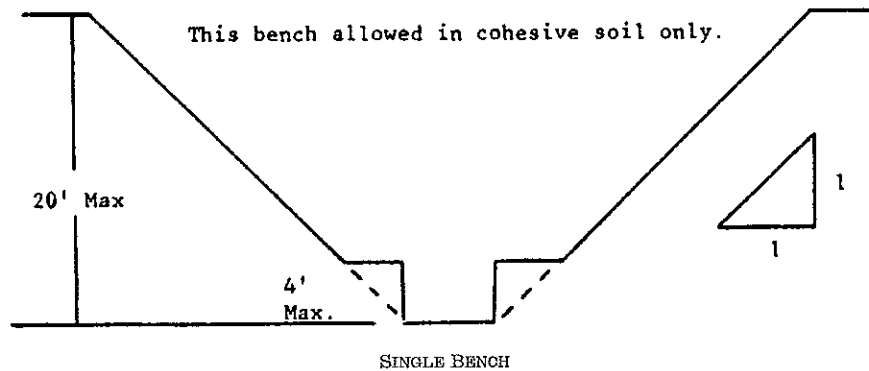
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

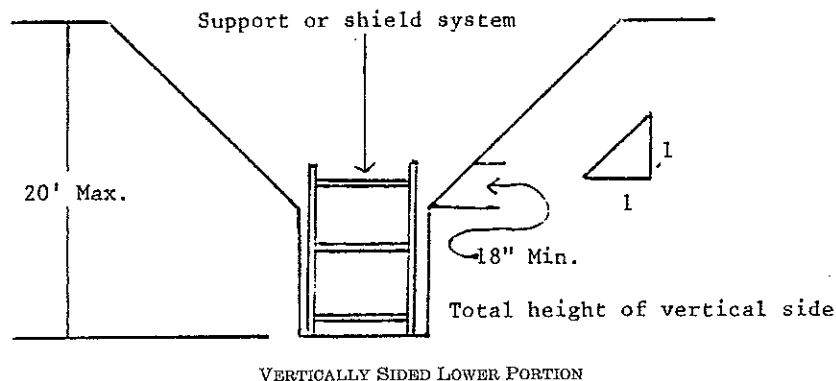


SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:



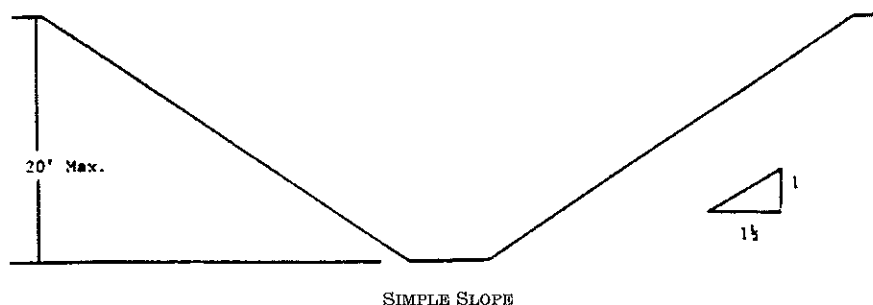
3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.



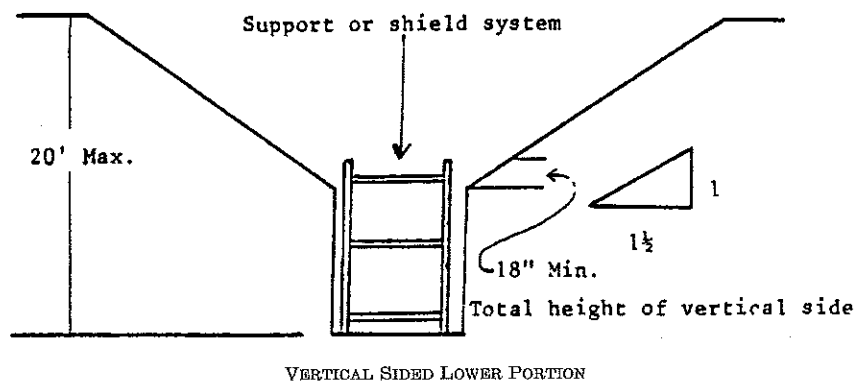
4. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



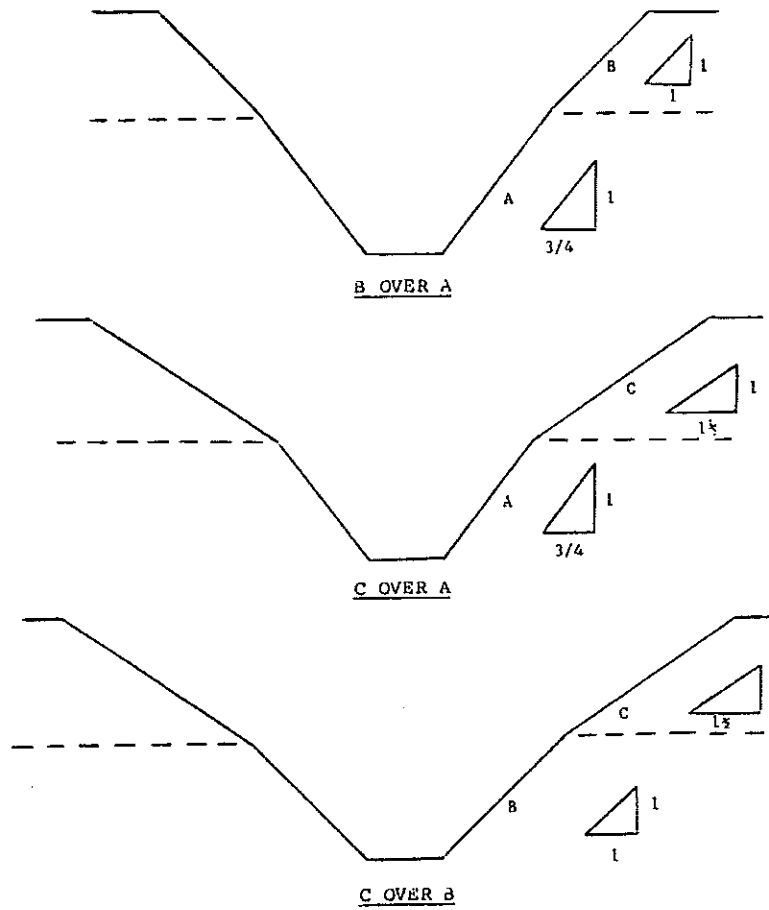
2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of $1\frac{1}{2}:1$.

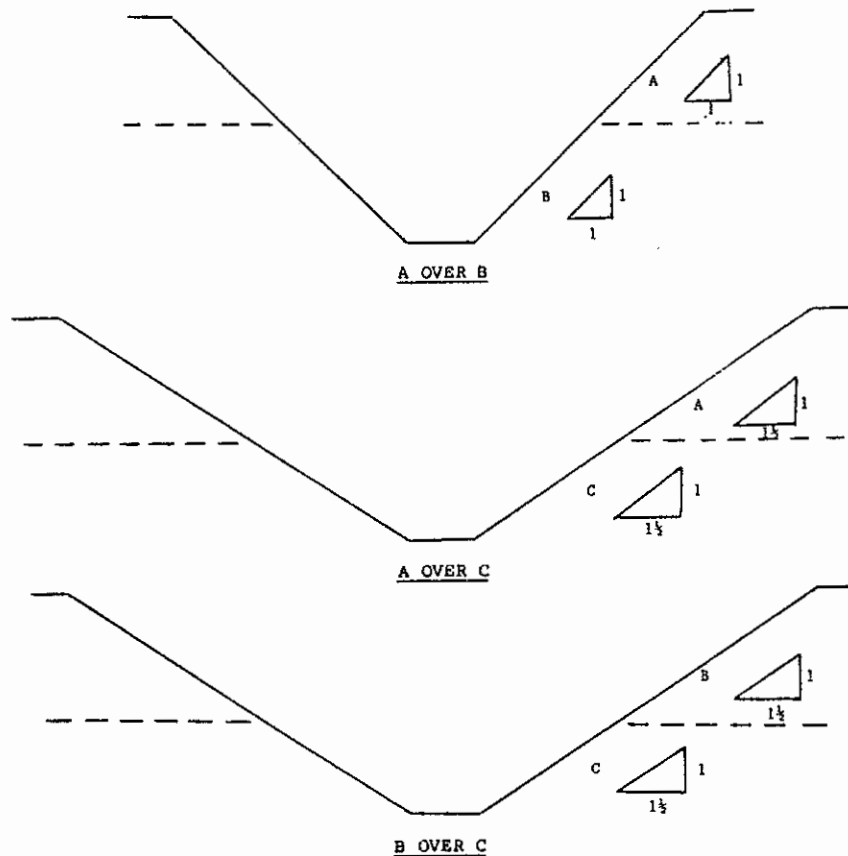


3. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

B-1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.





2. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

APPENDIX C TO SUBPART P OF PART 1926—TIMBER SHORING FOR TRENCHES

(a) *Scope.* This appendix contains information that can be used timber shoring is provided as a method of protection from cave-ins in trenches that do not exceed 20 feet (6.1 m) in depth. This appendix must be used when design of timber shoring protective systems is to be performed in accordance with §1926.652(c)(1). Other timber shoring configurations; other systems of support such as hydraulic and pneumatic systems; and other protective systems such as sloping, benching, shielding, and freezing systems must be designed in accordance with the requirements set forth in §1926.652(b) and §1926.652(c).

(b) *Soil Classification.* In order to use the data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of this part.

(c) *Presentation of Information.* Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables C-1.1, C-1.2, and C-1.3, and Tables C-2.1, C-2.2 and C-2.3 following paragraph (g) of the appendix. Each table presents the minimum sizes of timber members to use in a shoring system, and each table contains data only for the particular soil type in which the excavation or portion of

the excavation is made. The data are arranged to allow the user the flexibility to select from among several acceptable configurations of members based on varying the horizontal spacing of the crossbraces. Stable rock is exempt from shoring requirements and therefore, no data are presented for this condition.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix, and on the tables themselves.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations regarding Tables C-1.1 through C-1.3 and Tables C-2.1 through C-2.3 are presented in paragraph (g) of this Appendix.

(d) *Basis and limitations of the data*—(1) *Dimensions of timber members.* (i) The sizes of the timber members listed in Tables C-1.1 through C-1.3 are taken from the National Bureau of Standards (NBS) report, "Recommended Technical Provisions for Construction Practice in Shoring and Sloping of Trenches and Excavations." In addition, where NBS did not recommend specific sizes of members, member sizes are based on an analysis of the sizes required for use by existing codes and on empirical practice.

(ii) The required dimensions of the members listed in Tables C-1.1 through C-1.3 refer to actual dimensions and not nominal dimensions of the timber. Employers wanting to use nominal size shoring are directed to Tables C-2.1 through C-2.3, or have this choice under §1926.652(c)(3), and are referred to The Corps of Engineers, The Bureau of Reclamation or data from other acceptable sources.

(2) *Limitation of application.* (i) It is not intended that the timber shoring specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be designed as specified in §1926.652(c).

(ii) When any of the following conditions are present, the members specified in the tables are not considered adequate. Either an alternate timber shoring system must be designed or another type of protective system designed in accordance with §1926.652.

(A) When loads imposed by structures or by stored material adjacent to the trench weigh in excess of the load imposed by a two-foot soil surcharge. The term "adjacent" as used here means the area within a horizontal distance from the edge of the trench equal to the depth of the trench.

(B) When vertical loads imposed on cross braces exceed a 240-pound gravity load distributed on a one-foot section of the center of the crossbrace.

(C) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(D) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) *Use of Tables.* The members of the shoring system that are to be selected using this information are the cross braces, the uprights, and the wales, where wales are required. Minimum sizes of members are specified for use in different types of soil. There are six tables of information, two for each soil type. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is then made. The selection is based on the depth and width of the trench where the members are to be installed and, in most instances, the selection is also based on the horizontal spacing of the crossbraces. Instances where a choice of horizontal spacing of crossbracing is available, the horizontal spacing of the crossbraces must be chosen by the user before the size of any member can be determined. When the soil type, the width and depth of the trench, and the horizontal spacing of the crossbraces are known, the size and vertical spacing of the crossbraces, the size and vertical spacing of the wales, and the size and horizontal spacing of the uprights can be read from the appropriate table.

(f) *Examples to Illustrate the Use of Tables C-1.1 through C-1.3.*

(1) *Example 1.*

A trench dug in Type A soil is 13 feet deep and five feet wide.

From Table C-1.1, for acceptable arrangements of timber can be used.

Arrangement #B1

Space 4x4 crossbraces at six feet horizontally and four feet vertically.

Wales are not required.

Space 3x8 uprights at six feet horizontally. This arrangement is commonly called "skip shoring."

Arrangement #B2

Space 4x6 crossbraces at eight feet horizontally and four feet vertically.

Space 8x8 wales at four feet vertically.

Space 2x6 uprights at four feet horizontally.

Arrangement #B3

Space 6x6 crossbraces at 10 feet horizontally and four feet vertically.

Space 8x10 wales at four feet vertically.

Space 2x6 uprights at five feet horizontally.

Arrangement #B4

Space 6x6 crossbraces at 12 feet horizontally and four feet vertically.

Space 10x10 wales at four feet vertically.

Spaces 3x8 uprights at six feet horizontally.

(2) Example 2.

A trench dug in Type B soil in 13 feet deep and five feet wide. From Table C-1.2 three acceptable arrangements of members are listed.

Arrangement #B1

Space 6x6 crossbraces at six feet horizontally and five feet vertically.

Space 8x8 wales at five feet vertically.

Space 2x6 uprights at two feet horizontally.

Arrangement #B2

Space 6x8 crossbraces at eight feet horizontally and five feet vertically.

Space 10x10 wales at five feet vertically.

Space 2x6 uprights at two feet horizontally.

Arrangement #B3

Space 8x8 crossbraces at 10 feet horizontally and five feet vertically.

Space 10x12 wales at five feet vertically.

Space 2x6 uprights at two feet vertically.

(3) Example 3.

A trench dug in Type C soil is 13 feet deep and five feet wide.

From Table C-1.3 two acceptable arrangements of members can be used.

Arrangement #B1

Space 8x8 crossbraces at six feet horizontally and five feet vertically.

Space 10x12 wales at five feet vertically.

Position 2x6 uprights as closely together as possible.

If water must be retained use special tongue and groove uprights to form tight sheeting.

Arrangement #B2

Space 8x10 crossbraces at eight feet horizontally and five feet vertically.

Space 12x12 wales at five feet vertically.

Position 2x6 uprights in a close sheeting configuration unless water pressure must be resisted. Tight sheeting must be used where water must be retained.

(4) Example 4.

A trench dug in Type C soil is 20 feet deep and 11 feet wide. The size and spacing of members for the section of trench that is over 15 feet in depth is determined using Table C-1.3. Only one arrangement of members is provided.

Space 8x10 crossbraces at six feet horizontally and five feet vertically.

Space 12x12 wales at five feet vertically.

Use 3x6 tight sheeting.

Use of Tables C-2.1 through C-2.3 would follow the same procedures.

(g) Notes for all Tables.

1. Member sizes at spacings other than indicated are to be determined as specified in §1926.652(c), "Design of Protective Systems."

2. When conditions are saturated or submerged use Tight Sheeting. Tight Sheeting refers to the use of specially-edged timber planks (e.g., tongue and groove) at least three inches thick, steel sheet piling, or similar construction that when driven or placed in position provide a tight wall to resist the lateral pressure of water and to prevent the loss of backfill material. Close Sheeting refers to the placement of planks side-by-side allowing as little space as possible between them.

3. All spacing indicated is measured center to center.

4. Wales to be installed with greater dimension horizontal.

5. If the vertical distance from the center of the lowest crossbrace to the bottom of the trench exceeds two and one-half feet, uprights shall be firmly embedded or a mudsill shall be used. Where uprights are embedded, the vertical distance from the center of the lowest crossbrace to the bottom of the trench shall not exceed 36 inches. When mudsills are used, the vertical distance shall not exceed 42 inches. Mudsills are wales that are installed at the toe of the trench side.

6. Trench jacks may be used in lieu of or in combination with timber crossbraces.

7. Placement of crossbraces. When the vertical spacing of crossbraces is four feet, place the top crossbrace no more than two feet below the top of the trench. When the vertical spacing of crossbraces is five feet, place the top crossbrace no more than 2.5 feet below the top of the trench.

TABLE C-1.1

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE A $P_a = 25 \text{ X H} + 72 \text{ psf}$ (2 ft Surcharge)

| DEPTH OF TRENCH (FEET) | SIZE (ACTUAL) AND SPACING OF MEMBERS ** | | | | | | | | | | | | | | | | |
|------------------------|---|------------------------|---------|---------|----------|----------|----------------------|-----------|----------------------|---|-----|-----|-----|-----|-----|-----|-----|
| | CROSS BRACES | | | | | | WALES | | UPRIGHTS | | | | | | | | |
| | HORIZ. SPACING (FEET) | WIDTH OF TRENCH (FEET) | | | | | VERT. SPACING (FEET) | SIZE (IN) | VERT. SPACING (FEET) | MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET) | | | | | | | |
| | | UP TO 4 | UP TO 6 | UP TO 9 | UP TO 12 | UP TO 15 | | | | CLOSE | 4 | 5 | 6 | 8 | | | |
| 5 | UP TO 6 | 4X4 | 4X4 | 4X6 | 6X6 | 6X6 | 4 | Not Req'd | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TO 8 | UP TO 8 | 4X4 | 4X4 | 4X6 | 6X6 | 6X6 | 4 | Not Req'd | --- | --- | --- | --- | --- | --- | --- | --- | 2X8 |
| 10 | UP TO 10 | 4X6 | 4X6 | 4X6 | 6X6 | 6X6 | 4 | 8X8 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| | UP TO 12 | 4X6 | 4X6 | 6X6 | 6X6 | 6X6 | 4 | 8X8 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | UP TO 6 | 4X4 | 4X4 | 4X6 | 6X6 | 6X6 | 4 | Not Req'd | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TO 8 | UP TO 8 | 4X6 | 4X6 | 6X6 | 6X6 | 6X6 | 4 | 8X8 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | UP TO 10 | 6X6 | 6X6 | 6X6 | 6X8 | 6X8 | 4 | 8X10 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| | UP TO 12 | 6X6 | 6X6 | 6X6 | 6X8 | 6X8 | 4 | 10X10 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X8 | 6X8 | 4 | 6X8 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| TO 8 | UP TO 8 | 6X6 | 6X6 | 6X6 | 6X8 | 6X8 | 4 | 8X8 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 20 | UP TO 10 | 8X8 | 8X8 | 8X8 | 8X8 | 8X10 | 4 | 8X10 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| | UP TO 12 | 8X8 | 8X8 | 8X8 | 8X8 | 8X10 | 4 | 10X10 | 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| OVER 20 | SEE NOTE 1 | | | | | | | | | | | | | | | | |

* Mixed oak or equivalent with a bending strength not less than 880 psi.

** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-1.2

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE B $P_a = 45 \times H + 72$ psf (2 ft. Surcharge)

| DEPTH OF TRENCH (FEET) | SIZE (ACTUAL) AND SPACING OF MEMBERS** | | | | | | | | | | | | | |
|---------------------------------|--|------------------------|------------|------------|-------------|-------------|----------------------------|---------------|----------------------------|--|-----|-----|--|--|
| | HORIZ. SPACING (FEET) | CROSS BRACES | | | | | VERT. SPACING (FEET) | WALES | | UPRIGHTS | | | | |
| | | WIDTH OF TRENCH (FEET) | | | | | | SIZE (IN.) | VERT. SPACING (FEET) | MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET) | | | | |
| | | UP TO 4 | UP TO 6 | UP TO 9 | UP TO 12 | UP TO 15 | | | | CLOSE | 2 | 3 | | |
| 5 TO 10 | UP TO 6 | 4X6 | 4X6 | 6X6 | 6X6 | 6X6 | 5 | 6X8 | 5 | | | 2X6 | | |
| | UP TO 8 | 6X6 | 6X6 | 6X6 | 6X8 | 6X8 | 5 | 8X10 | 5 | | | 2X6 | | |
| | UP TO 10 | 6X6 | 6X6 | 6X6 | 6X8 | 6X8 | 5 | 10X10 | 5 | | | 2X6 | | |
| | See Note 1 | | | | | | | | | | | | | |
| 10 TO 15 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X8 | 6X8 | 5 | 8X8 | 5 | | 2X6 | | | |
| | UP TO 8 | 6X8 | 6X8 | 6X8 | 8X8 | 8X8 | 5 | 10X10 | 5 | | 2X6 | | | |
| | UP TO 10 | 8X8 | 8X8 | 8X8 | 8X8 | 8X10 | 5 | 10X12 | 5 | | 2X6 | | | |
| | See Note 1 | | | | | | | | | | | | | |
| 15 TO 20 | UP TO 6 | 6X8 | 6X8 | 6X8 | 8X8 | 8X8 | 5 | 8X10 | 5 | 3X6 | | | | |
| | UP TO 8 | 8X8 | 8X8 | 8X8 | 8X8 | 8X10 | 5 | 10X12 | 5 | 3X6 | | | | |
| | UP TO 10 | 8X10 | 8X10 | 8X10 | 8X10 | 10X10 | 5 | 12X12 | 5 | 3X6 | | | | |
| | See Note 1 | | | | | | | | | | | | | |
| OVER 20 | SEE NOTE 1 | | | | | | | | | | | | | |

* Mixed oak or equivalent with a bending strength not less than 850 psi.

** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-1.3

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *
SOIL TYPE C P_a = 80 X H + 72 psf (2 ft. Surcharge)

| DEPTH OF TRENCH (FEET) | SIZE (ACTUAL) AND SPACING OF MEMBERS** | | | | | | | | | | | UPRIGHTS | |
|---------------------------------|--|------------|------------|------------|-------------|-------------|----------------------------|---------------|----------------------------|--------------------------------------|--|----------|--|
| | CROSS BRACES | | | | | | VERT. SPACING (FEET) | SIZE (IN.) | VERT. SPACING (FEET) | MAXIMUM ALLOWABLE HORIZONTAL SPACING | | | |
| | WIDTH OF TRENCH (FEET) | | | | | | | | | (FEET) | | | |
| | HORIZ. SPACING (FEET) | UP TO 4 | UP TO 6 | UP TO 9 | UP TO 12 | UP TO 15 | | | | CLOSE | | | |
| 5 | UP TO 6 | 6X8 | 6X8 | 6X8 | 8X8 | 8X8 | 5 | 8X10 | 5 | 2X6 | | | |
| | UP TO 8 | 8X8 | 8X8 | 8X8 | 8X8 | 8X10 | 5 | 10X12 | 5 | 2X6 | | | |
| 10 | UP TO 10 | 8X10 | 8X10 | 8X10 | 8X10 | 10X10 | 5 | 12X12 | 5 | 2X6 | | | |
| | See Note 1 | | | | | | | | | | | | |
| 10 | UP TO 6 | 8X8 | 8X8 | 8X8 | 8X8 | 8X10 | 5 | 10X12 | 5 | 2X6 | | | |
| | UP TO 8 | 8X10 | 8X10 | 8X10 | 8X10 | 10X10 | 5 | 12X12 | 5 | 2X6 | | | |
| 15 | See Note 1 | | | | | | | | | | | | |
| | See Note 1 | | | | | | | | | | | | |
| 15 | UP TO 6 | 8X10 | 8X10 | 8X10 | 8X10 | 10X10 | 5 | 12X12 | 5 | 3X6 | | | |
| | See Note 1 | | | | | | | | | | | | |
| 20 | See Note 1 | | | | | | | | | | | | |
| | See Note 1 | | | | | | | | | | | | |
| OVER 20 | See Note 1 | | | | | | | | | | | | |

* Mixed Oak or equivalent with a bending strength not less than 850 psi.
** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.1

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *
 SOIL TYPE A $P_a = 25 \text{ X H} \pm 72 \text{ psf}$ (2 ft. Surcharge)

| DEPTH OF TRENCH (FEET) | SIZE (SIZES) AND SPACING OF MEMBERS ** | | | | | | | | | |
|---------------------------------|--|---------|---------|----------|----------|----------------------|-----------|---|-----|------|
| | CROSS BRACES | | | | | WALES | | UPRIGHS | | |
| | WIDTH OF TRENCH (FEET) | | | | | VERT. SPACING (FEET) | | MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET) | | |
| | UP TO 4 | UP TO 6 | UP TO 9 | UP TO 12 | UP TO 15 | UP TO SPACING (FEET) | SIZE (IN) | CLOSE | 4 | 5 |
| 5 | UP TO 4X4 | 4X4 | 4X4 | 4X4 | 4X6 | 4 | Not Req'd | | | |
| TO 8 | 4X4 | 4X4 | 4X4 | 4X6 | 4X6 | 4 | Not Req'd | | | 4X6 |
| TO 10 | 4X6 | 4X6 | 4X6 | 6X6 | 6X6 | 4 | 8X8 | 4 | | 4X6 |
| UP TO 12 | 4X6 | 4X6 | 4X6 | 6X6 | 6X6 | 4 | 8X8 | 4 | | 4X6 |
| 10 | UP TO 4X4 | 4X4 | 4X4 | 6X6 | 6X6 | 4 | Not Req'd | | | 4X10 |
| TO 8 | 4X6 | 4X6 | 4X6 | 6X6 | 6X6 | 4 | 6X8 | 4 | 4X6 | |
| TO 10 | 6X6 | 6X6 | 6X6 | 6X6 | 6X6 | 4 | 8X8 | 4 | | 4X8 |
| UP TO 12 | 6X6 | 6X6 | 6X6 | 6X6 | 6X6 | 4 | 8X10 | 4 | 4X6 | 4X10 |
| 15 | UP TO 6X6 | 6X6 | 6X6 | 6X6 | 6X6 | 4 | 6X8 | 4 | 3X6 | |
| TO 8 | 6X6 | 6X6 | 6X6 | 6X6 | 6X6 | 4 | 8X8 | 4 | 3X6 | 4X12 |
| TO 10 | 6X6 | 6X6 | 6X6 | 6X6 | 6X6 | 4 | 8X10 | 4 | 3X6 | |
| UP TO 12 | 6X6 | 6X6 | 6X6 | 6X6 | 6X6 | 4 | 8X12 | 4 | 3X6 | 4X12 |
| OVER 20 | SEE NOTE 1 | | | | | | | | | |

* Douglas fir or equivalent with a bending strength not less than 1500 psi.

** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.2

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *
SOIL TYPE B $P_a = 45 \text{ X H} + 72 \text{ psf}$ (2 ft. Surcharge)

| DEPTH OF TRENCH (FEET) | SIZE (S4S) AND SPACING OF MEMBERS ** | | | | | | | | | |
|---------------------------------|--------------------------------------|------------|------------|-------------|-------------|----------------------|------------|------------|-------------|-------------|
| | CROSS BRACES | | | | | RAILS | | | | |
| | WIDTH OF TRENCH (FEET) | | | | | VERT. SPACING (FEET) | | | | |
| | HORIZ. SPACING (FEET) | | | | | VERT. SPACING (FEET) | | | | |
| | UP TO 4 | UP TO 6 | UP TO 9 | UP TO 12 | UP TO 15 | UP TO 5 | UP TO 6 | UP TO 8 | UP TO 10 | UP TO 12 |
| 5 | 4X6 | 4X6 | 4X6 | 6X6 | 6X6 | 5 | 6X8 | 5 | 5 | 5 |
| TO | | | | | | | | | | |
| 10 | 4X6 | 4X6 | 4X6 | 6X6 | 6X6 | 5 | 8X8 | 5 | 5 | 5 |
| See Note 1 | | | | | | | | | | |
| 10 | UP TO 6 | 6X6 | 6X6 | 6X8 | 6X8 | 5 | 8X8 | 5 | 5 | 5 |
| TO | | | | | | | | | | |
| 15 | UP TO 8 | 6X8 | 6X8 | 8X8 | 8X8 | 5 | 10X10 | 5 | 5 | 5 |
| UP TO 10 | 6X8 | 6X8 | 8X8 | 8X8 | 8X8 | 5 | 10X12 | 5 | 5 | 5 |
| See Note 1 | | | | | | | | | | |
| 15 | UP TO 6 | 6X8 | 6X8 | 6X8 | 8X8 | 5 | 8X10 | 5 | 5 | 5 |
| TO | | | | | | | | | | |
| 20 | UP TO 8 | 6X8 | 6X8 | 8X8 | 8X8 | 5 | 10X12 | 5 | 5 | 5 |
| UP TO 10 | 8X8 | 8X8 | 8X8 | 8X8 | 8X8 | 5 | 12X12 | 5 | 5 | 5 |
| See Note 1 | | | | | | | | | | |
| OVER 20 | SEE NOTE 1 | | | | | | | | | |

* Douglas fir or equivalent with a bending strength not less than 1500 psi.
** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-2.3

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE C $P_a = 80 \times H + 72$ psf (2 ft. Surcharge)

| DEPTH OF TRENCH (FEET) | SIZE (S4S) AND SPACING OF MEMBERS ** | | | | | | | | | | UPRIGHTS | |
|------------------------|--------------------------------------|---------|---------|---------|----------|----------------------|----------------------|-----------|----------------------|-----------|---|--|
| | CROSS BRACES | | | | | WALES | | | | | MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET) | |
| | WIDTH OF TRENCH (FEET) | | | | | VERT. SPACING (FEET) | | | | | CLOSE | |
| | HORIZ. SPACING (FEET) | UP TO 4 | UP TO 6 | UP TO 9 | UP TO 12 | UP TO 15 | VERT. SPACING (FEET) | SIZE (IN) | VERT. SPACING (FEET) | SIZE (IN) | | |
| 5 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X6 | 8X8 | 5 | 8X8 | 5 | 3X6 | | |
| TO 8 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X6 | 8X8 | 5 | 10X10 | 5 | 3X6 | | |
| TO 10 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X6 | 8X8 | 5 | 10X12 | 5 | 3X6 | | |
| See Note 1 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X6 | 8X8 | 5 | 10X10 | 5 | 4X6 | | |
| TO 10 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X6 | 8X8 | 5 | 12X12 | 5 | 4X6 | | |
| TO 15 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X6 | 8X8 | 5 | 10X10 | 5 | 4X6 | | |
| TO 20 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X6 | 8X8 | 5 | 10X10 | 5 | 4X6 | | |
| OVER 20 | UP TO 6 | 6X6 | 6X6 | 6X6 | 6X6 | 8X8 | 5 | 10X10 | 5 | 4X6 | | |

* Douglas fir or equivalent with a bending strength not less than 1500 psi.

** Manufactured members of equivalent strength may be substituted for wood.

APPENDIX D TO SUBPART P OF PART 1926—ALUMINUM HYDRAULIC SHORING FOR TRENCHES

(a) *Scope.* This appendix contains information that can be used when aluminum hydraulic shoring is provided as a method of protection against cave-ins in trenches that

do not exceed 20 feet (6.1m) in depth. This appendix must be used when design of the aluminum hydraulic protective system cannot be performed in accordance with §1926.652(c)(2).

(b) *Soil Classification.* In order to use data presented in this appendix, the soil type or types in which the excavation is made must

first be determined using the soil classification method set forth in appendix A of subpart P of part 1926.

(c) *Presentation of Information.* Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables D-1.1, D-1.2, D-1.3 and D-1.4. Each table presents the maximum vertical and horizontal spacings that may be used with various aluminum member sizes and various hydraulic cylinder sizes. Each table contains data only for the particular soil type in which the excavation or portion of the excavation is made. Tables D-1.1 and D-1.2 are for vertical shores in Types A and B soil. Tables D-1.3 and D-1.4 are for horizontal waler systems in Types B and C soil.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(5) Miscellaneous notations (footnotes) regarding Table D-1.1 through D-1.4 are presented in paragraph (g) of this appendix.

(6) Figures, illustrating typical installations of hydraulic shoring, are included just prior to the Tables. The illustrations page is entitled "Aluminum Hydraulic Shoring; Typical Installations."

(d) *Basis and limitations of the data.* (1) Vertical shore rails and horizontal wales are those that meet the Section Modulus requirements in the D-1 Tables. Aluminum material is 6061-T6 or material of equivalent strength and properties.

(2) Hydraulic cylinders specifications. (i) 2-inch cylinders shall be a minimum 2-inch inside diameter with a minimum safe working capacity of no less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial compressive load at extensions as recommended by product manufacturer.

(3) Limitation of application.

(i) It is not intended that the aluminum hydraulic specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix must be otherwise designed as specified in § 1926.652(c).

(ii) When any of the following conditions are present, the members specified in the Ta-

bles are not considered adequate. In this case, an alternative aluminum hydraulic shoring system or other type of protective system must be designed in accordance with § 1926.652.

(A) When vertical loads imposed on cross braces exceed a 100 Pound gravity load distributed on a one foot section of the center of the hydraulic cylinder.

(B) When surcharge loads are present from equipment weighing in excess of 20,000 pounds.

(C) When only the lower portion or a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) *Use of Tables D-1.1, D-1.2, D-1.3 and D-1.4.* The members of the shoring system that are to be selected using this information are the hydraulic cylinders, and either the vertical shores or the horizontal wales. When a waler system is used the vertical timber sheeting to be used is also selected from these tables. The Tables D-1.1 and D-1.2 for vertical shores are used in Type A and B soils that do not require sheeting. Type B soils that may require sheeting, and Type C soils that always require sheeting are found in the horizontal wale Tables D-1.3 and D-1.4. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriate table, the selection of the size and spacing of the members is made. The selection is based on the depth and width of the trench where the members are to be installed. In these tables the vertical spacing is held constant at four feet on center. The tables show the maximum horizontal spacing of cylinders allowed for each size of wale in the waler system tables, and in the vertical shore tables, the hydraulic cylinder horizontal spacing is the same as the vertical shore spacing.

(f) *Example to Illustrate the Use of the Tables:*

(1) Example 1:

A trench dug in Type A soil is 6 feet deep and 3 feet wide. From Table D-1.1: Find vertical shores and 2 inch diameter cylinders spaced 8 feet on center (o.c.) horizontally and 4 feet on center (o.c.) vertically. (See Figures 1 & 3 for typical installations.)

(2) Example 2:

A trench is dug in Type B soil that does not require sheeting, 13 feet deep and 5 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinders spaced 6.5 feet o.c. horizontally and 4 feet o.c. vertically. (See Figures 1 & 3 for typical installations.)

(3) A trench is dug in Type B soil that does not require sheeting, but does experience some minor raveling of the trench face. The

trench is 16 feet deep and 9 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinder (with special oversleeves as designated by footnote #B2) spaced 5.5 feet o.c. horizontally and 4 feet o.c. vertically, plywood (per footnote (g)(7) to the D-1 Table) should be used behind the shores. (See Figures 2 & 3 for typical installations.)

(4) Example 4: A trench is dug in previously disturbed Type B soil, with characteristics of a Type C soil, and will require sheeting. The trench is 18 feet deep and 12 feet wide. 8 foot horizontal spacing between cylinders is desired for working space. From Table D-1.3: Find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. vertically and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally. 3x12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(5) Example 5: A trench is dug in Type C soil, 9 feet deep and 4 feet wide. Horizontal cylinder spacing in excess of 6 feet is desired for working space. From Table D-1.4: Find horizontal wale with a section modulus of 7.0 and 2 inch diameter cylinders spaced at 6.5 feet o.c. horizontally. Or, find horizontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet o.c. vertically. 3x12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(g) *Footnotes, and general notes, for Tables D-1.1, D-1.2, D-1.3, and D-1.4.*

(1) For applications other than those listed in the tables, refer to §1926.652(c)(2) for use of manufacturer's tabulated data. For trench depths in excess of 20 feet, refer to §1926.652(c)(2) and §1926.652(c)(3).

(2) 2 inch diameter cylinders, at this width, shall have structural steel tube (3.5x3.5x0.1875) oversleeves, or structural oversleeves of manufacturer's specification, extending the full, collapsed length.

(3) Hydraulic cylinders capacities. (i) 2 inch cylinders shall be a minimum 2-inch inside diameter with a safe working capacity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe work capacity of not less than 30,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(4) All spacing indicated is measured center to center.

(5) Vertical shoring rails shall have a minimum section modulus of 0.40 inch.

(6) When vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

(7) Plywood shall be 1.125 in. thick softwood or 0.75 inch. thick, 14 ply, arctic white birch (Finland form). Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores.

(8) See appendix C for timber specifications.

(9) Wales are calculated for simple span conditions.

(10) See appendix D, item (d), for basis and limitations of the data.

ALUMINUM HYDRAULIC SHORING TYPICAL INSTALLATIONS

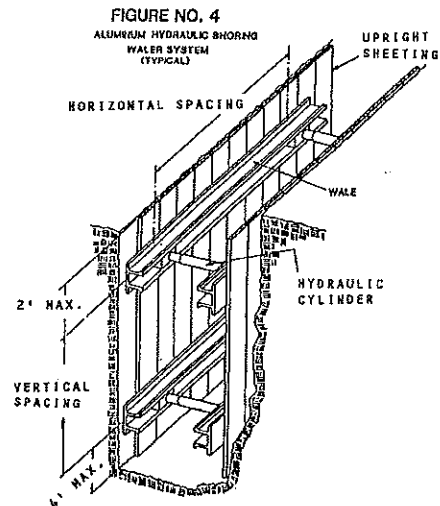
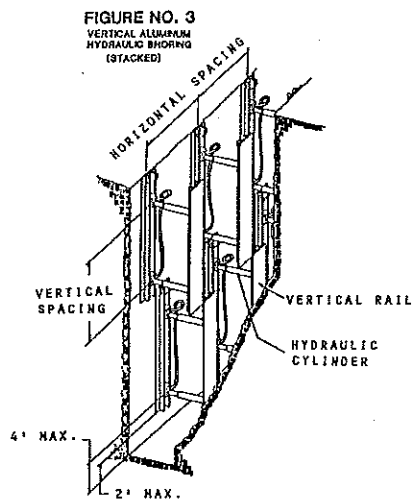
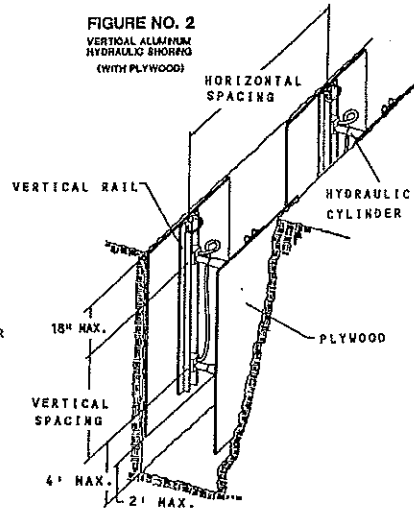
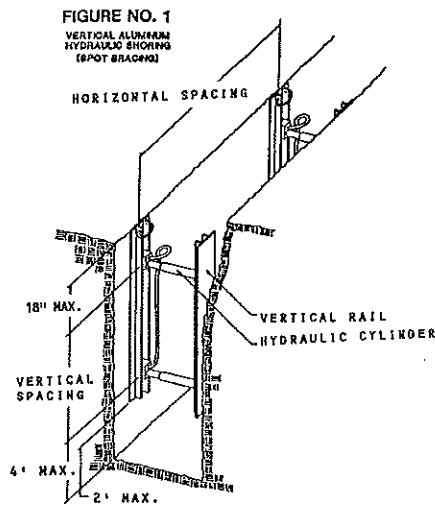


TABLE D - 1.1
ALUMINUM HYDRAULIC SHORING
VERTICAL SHORES
FOR SOIL TYPE A

| DEPTH OF TRENCH (FEET) | HYDRAULIC CYLINDERS | | | | |
|---------------------------------|--|--|------------------------|--------------------------------|---------------------|
| | MAXIMUM HORIZONTAL SPACING (FEET) | MAXIMUM VERTICAL SPACING (FEET) | WIDTH OF TRENCH (FEET) | | |
| | | | UP TO 8 | OVER 8 UP TO 12 | OVER 12 UP TO 15 |
| OVER 5 UP TO 10 | 8 | 4 | 2 INCH DIAMETER | 2 INCH DIAMETER NOTE (2) | 3 INCH DIAMETER |
| OVER 10 UP TO 15 | 8 | | | | |
| OVER 15 UP TO 20 | 7 | | | | |
| OVER 20 | NOTE (1) | | | | |

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

Note (1): See Appendix D, Item (g) (1)

Note (2): See Appendix D, Item (g) (2)

TABLE D - 1.2
ALUMINUM HYDRAULIC SHORING
VERTICAL SHORES
FOR SOIL TYPE B

| HYDRAULIC CYLINDERS | | | | | |
|------------------------|-----------------------------------|---------------------------------|------------------------|--------------------------|-----------------|
| DEPTH OF TRENCH (FEET) | MAXIMUM HORIZONTAL SPACING (FEET) | MAXIMUM VERTICAL SPACING (FEET) | WIDTH OF TRENCH (FEET) | | |
| | | | UP TO 8 | OVER 8 UP TO 12 | |
| OVER 5 UP TO 10 | 8 | 4 | 2 INCH DIAMETER | OVER 12 UP TO 15 | |
| OVER 10 UP TO 15 | 6.5 | | | 2 INCH DIAMETER NOTE (2) | 3 INCH DIAMETER |
| OVER 15 UP TO 20 | 5.5 | | | | |
| OVER 20 | NOTE (1) | | | | |

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

Note (1): See Appendix D, Item (g) (1)

Note (2): See Appendix D, Item (g) (2)

TABLE D - 1.3
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE B

| DEPTH OF TRENCH (FEET) | WALES | | HYDRAULIC CYLINDERS | | | | | | TIMBER UPRIGHTS | | |
|---------------------------------|-------------------------------|--|------------------------|----------------------|-------------------|----------------------|-------------------|----------------------|----------------------------------|-------------|------|
| | VERTICAL SPACING (FEET) | SECTION MODULUS (IN ³) | WIDTH OF TRENCH (FEET) | | | | | | MAX.HORIZ.SPACING (ON CENTER) | SOLID SHEET | |
| | | | UP TO 8 | | OVER 8 UP TO 12 | | OVER 12 UP TO 15 | | | | |
| | | | HORIZ. SPACING | CYLINDER DIAMETER | HORIZ. SPACING | CYLINDER DIAMETER | HORIZ. SPACING | CYLINDER DIAMETER | | | |
| OVER 5 UP TO 10 | 4 | 3.5 | 8.0 | 2 IN | 8.0 | NOTE(2) | 8.0 | 3 IN | — | — | 3x12 |
| | | 7.0 | 9.0 | 2 IN | 9.0 | NOTE(2) | 9.0 | 3 IN | | | |
| | | 14.0 | 12.0 | 3 IN | 12.0 | 3 IN | 12.0 | 3 IN | | | |
| OVER 10 UP TO 15 | 4 | 3.5 | 6.0 | 2 IN | 6.0 | NOTE(2) | 6.0 | 3 IN | — | 3x12 | — |
| | | 7.0 | 8.0 | 3 IN | 8.0 | 3 IN | 8.0 | 3 IN | | | |
| | | 14.0 | 10.0 | 3 IN | 10.0 | 3 IN | 10.0 | 3 IN | | | |
| OVER 15 UP TO 20 | 4 | 3.5 | 5.5 | 2 IN | 5.5 | NOTE(2) | 5.5 | 3 IN | 3x12 | — | — |
| | | 7.0 | 6.0 | 3 IN | 6.0 | 3 IN | 6.0 | 3 IN | | | |
| | | 14.0 | 9.0 | 3 IN | 9.0 | 3 IN | 9.0 | 3 IN | | | |
| OVER 20 | NOTE (1) | | | | | | | | | | |

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g)

Notes (1): See Appendix D, item (g) (1)

Notes (2): See Appendix D, item (g) (2)

* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

TABLE D - 1.4
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE C

| DEPTH OF TRENCH (FEET) | WALES | | HYDRAULIC CYLINDERS | | | | | | TIMBER UPRIGHTS | |
|---------------------------------|-------------------------------|--|---|---|---|---|---|----------------------|------------------------------------|-------|
| | VERTICAL SPACING (FEET) | SECTION MODULUS (IN ³) | WIDTH OF TRENCH (FEET) | | | | | | MAX. HORIZ. SPACING (ON CENTER) | |
| | | | UP TO 8 | | OVER 8 UP TO 12 | | OVER 12 UP TO 15 | | SOLID | 3 FT. |
| | | | HORIZ. CYLINDER SPACING DIAMETER | HORIZ. CYLINDER SPACING DIAMETER | HORIZ. CYLINDER SPACING DIAMETER | HORIZ. CYLINDER SPACING DIAMETER | HORIZ. CYLINDER SPACING DIAMETER | CYLINDER DIAMETER | SHEET | |
| OVER 5 UP TO 10 | 4 | 3.5 | 6.0 | 2 IN | 6.0 | NOTE(2) | 6.0 | 3 IN | | |
| | | 7.0 | 6.5 | 2 IN | 6.5 | NOTE(2) | 6.5 | 3 IN | 3x12 | |
| | | 14.0 | 10.0 | 3 IN | 10.0 | 3 IN | 10.0 | 3 IN | | |
| OVER 10 UP TO 15 | 4 | 3.5 | 4.0 | 2 IN | 4.0 | NOTE(2) | 4.0 | 3 IN | | |
| | | 7.0 | 5.5 | 3 IN | 5.5 | 3 IN | 5.5 | 3 IN | 3x12 | |
| | | 14.0 | 8.0 | 3 IN | 8.0 | 3 IN | 8.0 | 3 IN | | |
| OVER 15 UP TO 20 | 4 | 3.5 | 3.5 | 2 IN | 3.5 | NOTE(2) | 3.5 | 3 IN | | |
| | | 7.0 | 5.0 | 3 IN | 5.0 | 3 IN | 5.0 | 3 IN | 3x12 | |
| | | 14.0 | 6.0 | 3 IN | 6.0 | 3 IN | 6.0 | 3 IN | | |
| OVER 20 | NOTE (1) | | | | | | | | | |

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, item (g)

Notes (1): See Appendix D, item (g) (1)

Notes (2): See Appendix D, item (g) (2)

* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

APPENDIX E TO SUBPART P OF PART 1926—ALTERNATIVES TO TIMBER SHORING

Figure 1. Aluminum Hydraulic Shoring

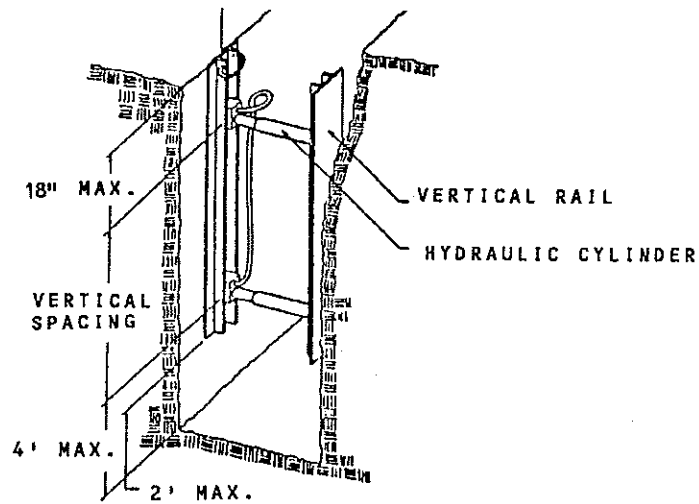


Figure 2. Pneumatic/hydraulic Shoring

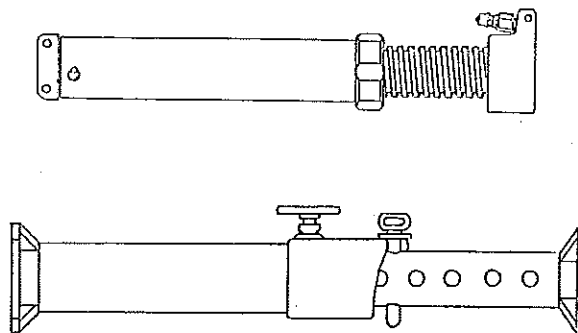


Figure 3. Trench Jacks (Screw Jacks)

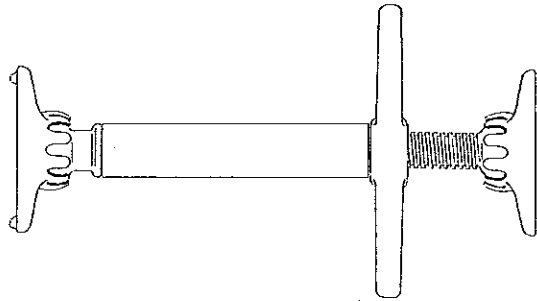
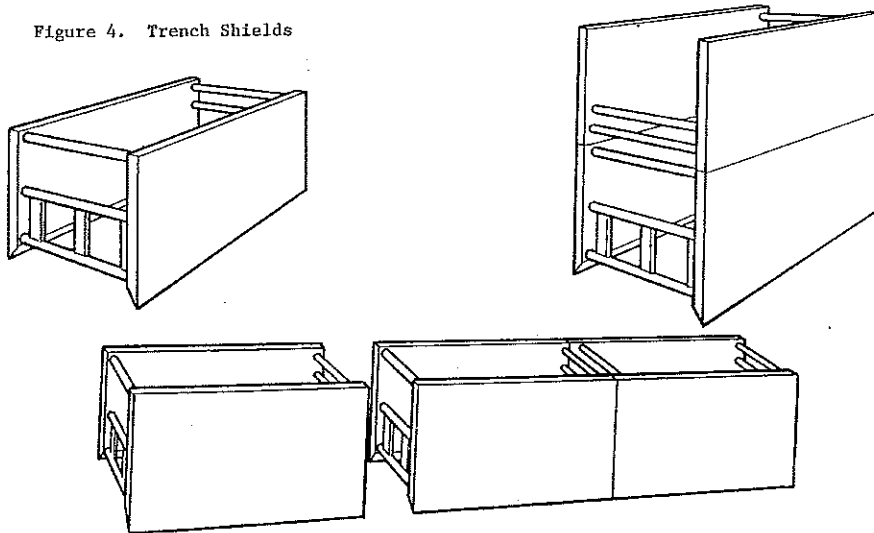


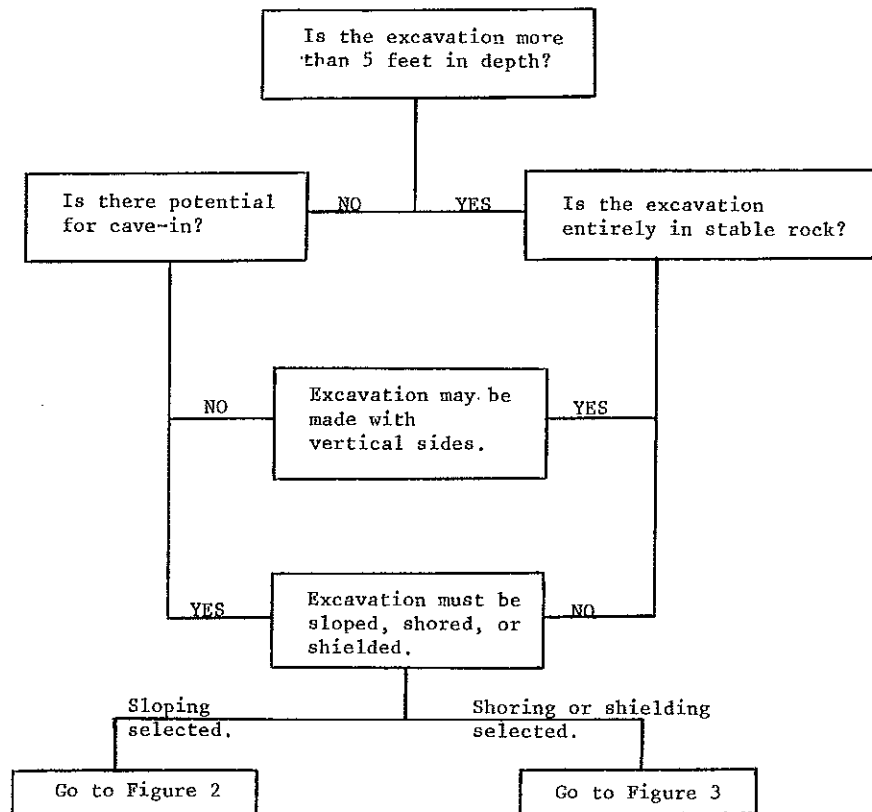
Figure 4. Trench Shields



APPENDIX F TO SUBPART P OF PART
1926—SELECTION OF PROTECTIVE
SYSTEMS

The following figures are a graphic summary of the requirements contained in sub-

part P for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer in accordance with § 1926.652 (b) and (c).

FIGURE 1 - PRELIMINARY DECISIONS

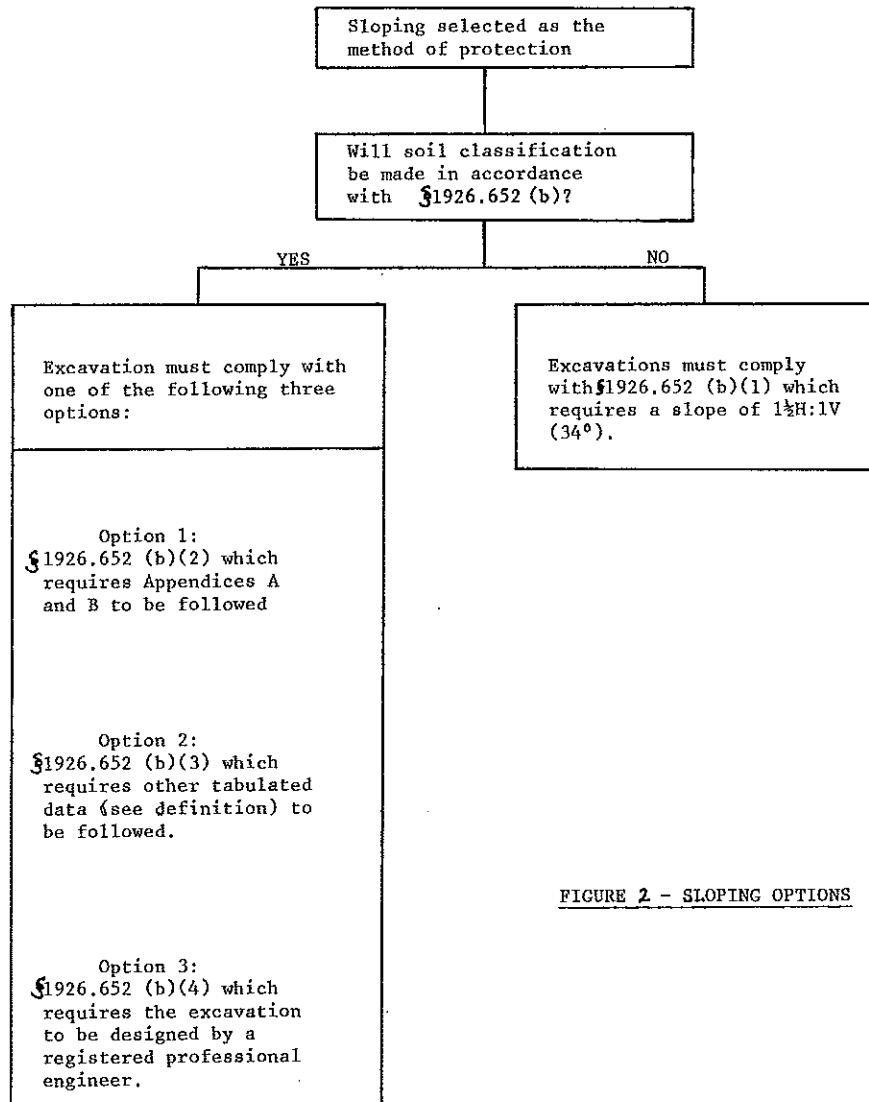


FIGURE 2 - SLOPING OPTIONS

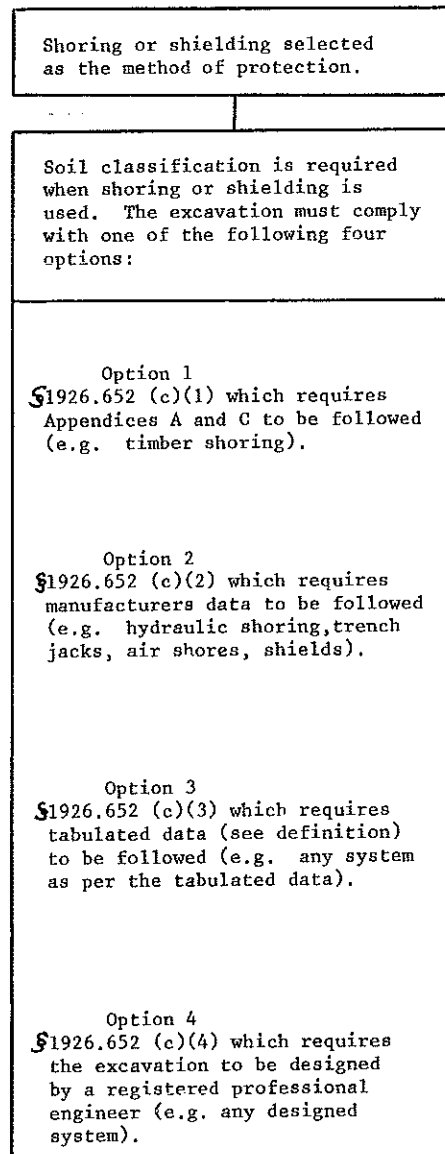


FIGURE 3 - SHORING AND SHIELDING OPTIONS

APPENDIX 13

ONE-CALL SYSTEMS FOR EXCAVATIONS

Introducing
811
PRESS KIT



Background on Common Ground Alliance

- **Common Ground Alliance originated as an extension of the Common Ground Study.**

The Common Ground Alliance (CGA) was created in 2000 after the U.S. Department of Transportation released a study addressing the best practices relating to damage prevention. The study, released in 1999, was never intended to be a fixed model, but to evolve as experts learn more and technology advances. The CGA was formed by a federal mandate to continue the development of best practices for damage prevention. CGA is a member-driven organization with more than 1,400 individual members, member organizations and sponsors in 15 stakeholder groups that comprise the underground utility and damage prevention industry. These groups include excavators, locators, road builders, electric, telecommunications, oil, gas, railroad, one call centers, public works, equipment manufacturing & suppliers, state regulators, insurance & engineering/design and emergency services.

- **Common Ground Alliance promotes effective damage prevention practices.**

From its inception, CGA has promoted effective damage prevention practices in order to ensure public safety, environmental protection and the integrity of services. To achieve these goals, CGA fosters a sense of shared responsibility for the protection of underground facilities; supports research; develops and conducts public awareness and education programs; identifies and disseminates stakeholder best practices such as those embodied in the Common Ground Study; and serves as a clearinghouse for damage data collection, analysis and dissemination. The CGA also works with industry stakeholders and regulators to produce stronger, more effective results through partnership, collaboration and the pursuit of common goals in damage prevention.

- **The Common Ground Alliance (CGA) will work with its 1,400 individual members, member organizations, sponsors and 811 campaign national launch partners to reach target audiences.**

The designation of a national 811 "Call Before You Dig" number provides CGA with a unique, once-in-a-lifetime opportunity to focus national attention on the importance of calling before digging. CGA will work with its entire network and its national launch partners to reach all aspects of the digging world and educate them on the relevance of 811.

Frequently Asked Questions

- **Who is CGA?**

The Common Ground Alliance (CGA) is a coalition of 1,400 excavators, locators, road builders, electric, telecommunications, oil, gas, railroad, one call centers, public works, equipment manufacturing & suppliers, state regulators, insurance & engineering/design and emergency services. Officially formed in 2000, CGA represents a continuation of the United States Department of Transportation's Common Ground Study, which highlighted the need for one organization to continuously update best practices among the growing underground utility industry. The Common Ground Alliance was thus formed to prevent damages to underground infrastructure, reduce service disruptions, save lives, and improve safety practices industry-wide.

- **What is the purpose of CGA? How does it achieve its goals?**

CGA works to prevent damage to underground infrastructure by developing best practices for the industry. The organization is also involved in other activities in an effort to achieve this goal. Research & development, data reporting & evaluation and education programs are all important methods CGA uses to promote effective damage prevention practices. In fact, CGA works with its members and industry stakeholders to create effective results through partnership, collaboration, and the pursuit of common goals in damage prevention.

- **What exactly is 811?**

811 is a FCC-designated national N-11 number for homeowners and professional excavators to call before digging. 811 calls will be directed to the local One Call Center and the affected utilities, who will then mark underground lines for free. The national 811 campaign will increase awareness among the public about the importance of having utility lines marked before digging. Digging without calling can lead to severe consequences including harm to those who dig, costly damages to underground infrastructure and utility service disruptions.

- **Don't "Call Before You Dig" numbers already exist?**

There are multiple "Call Before You Dig" numbers established by the existing 62 One Call Centers, or "Call Before You Dig" centers. The national 811 number will eliminate the confusion of multiple numbers while continuing free and easy local service. In fact, in a recent national survey, nine out of ten (89%) professional excavators agreed that calling before to get utility lines marked is a fast and easy process.

- **Why is a national 811 number necessary?**

Those who dig are aware of "Call Before You Dig" services, but often make risky assumptions about where utility lines are buried or when they should call. In fact, a recent national survey showed that only 33% of homeowner do-it-yourselfers called to have their lines marked before starting digging projects. Simple digging jobs can damage utility lines, which can disrupt service to an entire neighborhood, harm diggers, and potentially result in fines and repair costs. 811 will let diggers know what's below when they call before they dig.

- **What is CGA's role in promoting 811?**

CGA's mission is to prevent damage to underground infrastructure. The national 811 number provides a once-in-a-lifetime opportunity to focus national attention on the importance of calling before digging as simple digging jobs can damage utility lines. CGA will work with its members, sponsors, and national launch partners in the 811 campaign to increase awareness about the new number and create positive behavior change.

Background on the 811 campaign

- **811 is a new federally-mandated FCC designated N-11 number**

The new 811 number is a national “Call Before You Dig” phone number designated by the FCC to eliminate the confusion of multiple “Call Before You Dig” numbers and help save lives by minimizing damages to underground utilities. One easy phone call to 811 quickly begins the process of getting underground utility lines marked. Local One Call Center personnel will then notify affected utility companies, who will send crews to mark underground lines for free.

- **811 will help save lives and protect infrastructure**

Knowing where underground utility lines are buried before each digging project begins helps to prevent injury, expense and penalties. The depth of utility lines may vary and multiple utility lines may exist in one area. Simple digging jobs can damage utility lines and can disrupt vital services to an entire neighborhood, harm those who dig and result in expensive fines and repair costs. Marked lines show those who dig the approximate location of underground lines and help prevent undesired consequences.

- **The 811 campaign will target diggers—professional excavators and do-it-yourself homeowners**

A recent national survey revealed that roughly half of Americans are “active diggers” who have done (or are planning to do) some type of digging project at home, yet only a third have called or will call to get their utility lines marked. CGA member organizations and national launch partners will conduct outreach to increase awareness of the new 811 number, demonstrate its relevance and create positive behavioral change among those most likely to dig.

- **The Common Ground Alliance (CGA) will work with its 1,400 individual members, member organizations, sponsors and 811 campaign national launch partners to reach target audiences**

The designation of a national 811 “Call Before You Dig” number provides CGA with a unique, once-in-a-lifetime opportunity to focus national attention on the importance of calling before digging. CGA will work with its entire network and its national launch partners to reach all aspects of the digging world and educate them on the relevance of 811.

APPENDIX 14

WORK RULES FOR ALL FIELD FORCES



J. J. White, Inc.

Work Rules for Field Employees

Policy Statement

J.J. White, Incorporated is committed to “Enduring Excellence”, a Management System enabling us to continually meet or exceed the expectations of our customers and our community. This is achieved through:

- * complying with legal/regulatory requirements**
- * utilizing our most valuable resource, our employees**
- * reliable, safe and environmentally friendly work practices,**
- * completing projects on time while maintaining a superior level of quality, and**
- * continuous improvement.**

JJ White, Incorporated – Standard Work Rules for Field Employees

J.J. White, Incorporated has a long-standing reputation as a world class provider of construction services performed in a safe, efficient and cost-effective manner. In coming to work for our company, you agree to maintain and further this tradition by strict adherence to the following rules:

1. Safety/Security

- a. If you have any health condition that could, in any way, affect your ability to work safely on this job, you must report it to your foreman/superintendent immediately.**
- b. Employees’ attendance at training at time of hire based off the requirements of the job site and safety “Tool-Box” meetings is mandatory as well as participation in the NMGC program. Failure to participate or attend all such scheduled meetings will result in disciplinary action, which may include termination of employment. Signatory confirmation of an employee’ s attendance will be required at each meeting. Additionally, safety is everyone’ s responsibility, especially yours. Therefore, should you have any questions regarding any safety issue during your employment with J.J. White, Incorporated on this project, you should immediately bring them to the attention of your Foreman and/or Superintendent.**

- c. The wearing of Company-provided hard hats, Company-provided safety glasses, leather work gloves and sturdy leather work boots (purchased by employee) is mandatory on all work sites. Hard hats must be worn with the brim facing forward, unless you are wearing additional safety equipment which requires otherwise (e.g. a welding shield). Additional Personal Protective Equipment may be required. You must check with your Foreman or Superintendent if, at any time, you are unsure as to the proper Personal Protective Equipment to be worn. **If you are injured as a result of non-compliance with any portion of this section c., in addition to disciplinary action, you may be ineligible for Workers' Compensation benefits.**
- d. Employees are not allowed to wear any loose-fitting jewelry while working. It is recommended that all valuables be left at home, as J.J. White, Incorporated does not take any responsibility for loss of personal possessions.
- e. **In the case of an accident, injury or incident of any type, you must immediately notify your Foreman and the jobsite Superintendent.** If your injury requires medical treatment beyond first aid, you must follow the J.J. White, Incorporated Rules for Employees Injured On-the-Job. You will be required to sign a copy of these rules at the time of your injury.
- f. Under no circumstances is a J.J. White, Incorporated employee to complete any type of Work Permit without the written approval/final signature of an authorized representative of the owner. It is the responsibility of the site owner to provide J.J. White, Incorporated a completed Work Permit with all necessary information included.
- g. All employees will adhere to the safe work practices and procedures in place. For example, hot work permitting, confined spaces, Lockout/Tagout procedures, electrical safety, etc. Copies of the applicable policies are available for your review and should be requested from your job site superintendent.
- h. All employees must comply with the drug and alcohol policies of J.J. White, Incorporated and the site Owner and are subject to Drug and Alcohol Screening for pre-employment, post-accident, random, or the Illegal Substance Search Policy established by each. Copies of the applicable policies are available for your review and should be requested from your job site superintendent.
- i. Employees are strictly prohibited from bringing firearms and/or other weapons to the work place. This includes storage of such items within any vehicle while on the Company and/or Owner's premises and/or any parking lot provided for the benefit of the employees.
- j. Good housekeeping is essential to the safe and efficient completion of the job. It is the responsibility of each employee to make sure that their work area is clean and free from debris of any kind at all times.
- k. All employees are expected to comply with all of the site owner's policies and procedures, including security/inspection requirements. Failure to comply with any owner policy or procedure, including a request to search, will be grounds for disciplinary action, up to, and including, termination.

2. **Attendance Policy** – this policy will not apply to any absences/incomplete shifts protected by law (e.g. FMLA, Military Leave); **for purposes of sections a. and b. of this policy only, proper notice shall be defined as a conversation with an employee’s superintendent before the end of the first two hours of the shift involved.**

a. Absenteeism: (Employee absent for an entire shift)

An employee may be discharged on the first occasion on which he, or she, is absent from work without providing proper notification.

An employee may be discharged on the second occasion, whether consecutive or not, on which he or she is absent from work and fails to provide proper notice.

An employee **will be discharged** on the third occasion, whether consecutive or not, on which he or she is absent from work and fails to provide proper notice.

b. Incomplete Shift: (Employee absent for any part(s) of shift)

c.

An employee may be discharged on the second occasion, whether consecutive or not, on which he or she arrives late, or leaves early, without providing proper notice.

An employee **will be discharged** on the third occasion, whether consecutive or not, on which he or she arrives late, or leaves early, without providing proper notice.

Notes:

- If an employee arrives late and leaves early in the same shift, the late arrival and early departure will be counted as separate incidents for purposes of the above rules.
- When late, an employee should be started to work at the next fifteen-minute interval after reporting to work, and should be paid only for the time worked

a. The phone number for this Job Site is:_____.

The Project Superintendent is:_____.

The phone number for J.J. White, Incorporated’s Main Office is: **(215) 722-1000.**

b. Employees must provide written notification to the job superintendent at least seven calendar (7) days in advance of any vacation. Failure to provide timely notification may result in disciplinary action up to, and including, termination.

3. Work Schedules

- a. The work shift schedule for this job is _____ thru _____. Changes in this schedule may be made by the company in its sole discretion and employees will be notified by their foreman and/or superintendent.

| | | |
|------------------------------------|----------|-------|
| The Starting time for this job is: | AM/PM | |
| First break (paid) is from: | AM/PM to | AM/PM |
| Lunch (unpaid) is from: | AM/PM to | AM/PM |
| The Shift end for this job is: | AM/PM | |

- b. All employees will be expected to “brown bag” a lunch and carry a thermos bottle.
- c. In no event shall any employee be on-duty, with scheduled break time included, more than 16 hours in a 24 hour period. Circumventing this policy without prior consent from the Sr. Vice President of Operations, or the Group Vice President/Leader may result in disciplinary action, up to and including possible termination of employment.
- d. It is understood and agreed that employees will work their entire shift on all scheduled workdays, including inclement weather. Rain gear will be provided by J.J. White, Inc. at the start of the employee’s work shift. If the rain gear wears out, it must be returned to the Tool and Equipment Manager who will provide you with another set.
- e. This position is exclusively seasonal in nature in that, by definition, it is tied to a specific and fixed period job cycle, which is only carried on for the period as specified in the instant employment contract. Accordingly, the position cannot, and is not, carried on throughout the year.

4. Employee Conduct

- a. All employees are expected to carry out their work in a safe and professional manner. Insubordination will not be tolerated and will result in disciplinary action as outlined in the J.J. White, Incorporated Safety Awareness Manual. All employees should make themselves familiar with this manual and its contents. The manual can be found at the jobsite office trailer and is available for your review prior to, and after, each shift and during regular breaks.
- b. The Company will not engage in, or tolerate, any unlawful behavior, including discrimination, harassment or retaliation. Any person who, after appropriate investigation, has been found to have engaged in any such illegal behavior, will be subject to appropriate discipline, up to, and including, termination of his/her employment.

In particular, employees are strictly prohibited from bringing any material of a sexually explicit or suggestive nature onto the work site. Any person who, after appropriate investigation, has been found to have brought such material onto the work site, will be subject to disciplinary action, up to, and including, termination of his or her employment.

Please see the Company's EEO Policy and Complaint procedure for other examples of prohibited conduct and what to do if you believe there has been any unlawful discrimination, harassment or retaliation. If you don't have a copy of the policy, you should send a written request to: Director of Risk Management, J. J. White, Incorporated, 5500 Bingham St., Philadelphia, PA 19120.

- c. Smoking **WILL NOT** be permitted at any J. J. White, Inc. office or shop facility or any ancillary locations inside any compound. Smoking will **ONLY** be permitted on job sites where the Owner has designated areas for such.
- d. Cell phones and other electronic communicating devices are permitted in the Contractor's change trailers only. Many Owners have additional site rules, including a complete ban on all electronic devices, particularly any item capable of taking a digital image or photograph. If you have any questions regarding allowable devices you must contact your foreman or superintendent.

5. Use of Company Vehicles

Company vehicles, including those vehicles under rental agreement through the Company, shall not be utilized by any employee unless specifically authorized to do so. Authorization for the use of a Company vehicle or a vehicle under a rental agreement through the Company may be granted in one of the two ways:

- 1) Specific Authorization - Wherein a Company vehicle or a vehicle under a rental agreement through the Company will be assigned to a specific individual employee and the employee so assigned will have read and acknowledged all terms and conditions of the Company's Fleet Safety Program in advance of any use. Further, Specific Authorization may only be granted by an Officer of the Company and such authorization will only be effective once all conditions of the Fleet Safety Program have been met.
- 2) Temporary Authorization - Wherein a Company vehicle or a vehicle under a rental agreement through the Company may be temporarily assigned to an employee of the Company for a limited duration of time not to exceed the duration of the shift on which the employee is assigned. An employee so granted Temporary Authorization is never authorized to utilize a vehicle for the purposes of commuting to and from the work site. Further, an employee granted Temporary Authorization must directly evidence their operator's license to the authorizing Company Supervisor, and must verbally confirm to the authorizing Company Supervisor that their operator's license is currently in good standing in the State for which it has been issued. Further, an employee granted Temporary Authorization shall never operate any vehicle off of the immediate project site for any reason unless specifically instructed by a Company Supervisor to do so.

Regardless of the method of Authorization, Company vehicles or a vehicle under a rental agreement through the Company are only to be used in the furtherance of Company business. Company vehicles will not be used to carry employees outside of the Owner's gate or off the job site for any reason other than Company business. All vehicles will be utilized in a safe and courteous manner, including adherence to any and all State Laws and Regulations regardless of the vehicle's location at any time during its use. Further all vehicles will be operated in a manner so as to fully comply with any safety regulations, as set forth by the Owner when operating on an Owner's premises. Carelessness, damage or misuse of a vehicle will not be tolerated.

6. Tools and Equipment

Tools and Equipment are, at all times, to be kept clean and in good working condition. Carelessness, loss or misuse will not be tolerated. If you are working at a job site where a Tool Room Manager is present, you will be expected to comply with all rules governing the issuance of tools on that job.

7. Miscellaneous Provisions

- a. Banned Tools – The following tools are banned from use on all JJ White, Inc. projects. *(Note the tools listed below are in addition to any tools which may be banned from use on the project site as imposed by a specific Owner and/or Client.)* Use of any of these tools on a JJ White Inc. project will result in disciplinary action up to and including possible termination of employment:
 1. Any and all homemade and/or non-factory modified tools of any type.
 2. Any and all utility knives not equipped with a self-retracting blade.
 3. Any and all wedges that are not tethered.* *(*An exception may only be provided by the Group Operations Manager.)*
 4. Any and all Air Guns and/or Impact Guns that do not allow for the use of a retainer ring (i.e. a hole in the shaft) to allow the socket to be pinned/held in position.
- b. High Pressure Water Wash Anti-Withdraw Device – An Anti-Withdraw Device must be affixed to all High Pressure Water Wash Lances without exception. The use of any High Pressure Water Wash Lance without an Anti-Withdraw Device on any JJ White Inc. project will result in disciplinary action up to and including possible termination of employment.
- c. Sealed Safety Eyewear for Prescription Eyeglass Wearers - Where the conditions of the work environment require the use of sealed eyewear, all JJ White Inc. employees wearing prescription eyewear, regardless of style, are required to wear the Encon XPR 360 style sealed safety eyewear. Contact your site Superintendent or Safety Coordinator to receive your pair as needed. The use of any other sealed eyewear by employees who wear prescription eyewear is strictly prohibited. The use of any other style of sealed eyewear atop prescription eyewear without advance authorization from the JJ White Superintendent or Safety Coordinator will result in disciplinary action up to and including possible termination of employment.

Work Rules for all Field Forces – J.J. White, Inc.

D. All electric grinders must be of a quick brake or fast brake clutch design.

My signature below indicates that I have read, understood and agree to abide by the above Policy Statement and Standard Work Rules, along with the J.J. White, Inc. Safety Rules and Regulations, as well as, J.J. White Inc. Disciplinary Policy, all of which are available for review as contained within the J.J. White, Incorporated Safety Awareness Manual.

Employee's Signature

Print Name of Employee

Date

J. J. White, Incorporated Superintendent Signature

Date

Job Number



J. J. White, Incorporated
Rules for Employees Injured On-the-Job

If you are injured while working for J. J. White, Incorporated, you must do the following:

- 1) In order to ensure that you receive the appropriate medical treatment for your injury, you must report the incident **IMMEDIATELY** to your Foreman and/or Superintendent; if your injury is serious and you require emergency treatment, they will arrange transportation for you to the appropriate acute care provider. If your injury does not require emergency treatment, proceed to step 2.
- 2) Complete and sign the J. J. White Incorporated Medical Consent Form and the J. J. White Incorporated Employee Notification & Acknowledgement Form (PA only) and the J. J. White Incorporated Injured Employee Accident Report and return these to your Foreman or Superintendent, along with a copy of some form of photo identification (e.g. driver's license); once these forms are completed, your Foreman/Superintendent will call the J. J. White Incorporated Risk Management Department, which will schedule an appointment (where necessary) with the appropriate physician and notify your Foreman/Superintendent of the date and time of that appointment.
- 3) After the doctor has completed your initial evaluation and treatment, if you have been cleared to return to full-duty work and your normal shift has not ended, return to the job and report to your foreman or superintendent, providing them with a copy of the medical report from the physician; if your shift has ended, call your foreman or superintendent and let them know you will be returning to work the next day. If you have not been cleared to return to full-duty work, you must: 1) contact your foreman or superintendent and tell them the physical restrictions the doctor has given you, 2) read and sign a copy of the Work Rules for Temporary Modified Duty, and 3) contact the J. J. White, Incorporated Risk Management Department at (215) 722-1000 and provide the same information; you will then be advised as to where and when to report for your next shift.
- 4) If your injury requires additional doctor visits and/or treatments which will be scheduled during your normal working hours, you must notify your foreman or superintendent at least 24 hours prior to the scheduled appointment and, after each appointment, provide a written notice from the doctor as to the time in and time out of your appointment.
- 5) If your injury requires treatment which will disable you for any period of time (e.g. surgery), you must contact the J. J. White, Incorporated Risk Management Department at (215) 722-1000 prior to the disabling treatment at least weekly thereafter (unless advised otherwise by the J. J. White Incorporated Risk Manager) until you are medically cleared by your physician to return to full-duty work.
- 6) If, at any time, you are dissatisfied with the treatment provided by your medical provider, you must contact the J. J. White, Incorporated Risk Management Department at (215) 722-1000 to discuss alternative providers.

I hereby acknowledge that I have been informed of, and understand, the above rules.

J. J. White, Incorporated Employee's Signature

Date



J. J. White, Incorporated
Employee Notification & Acknowledgement Form
And Workers' Compensation Information

Workers' Compensation is designed to provide wage loss benefits and reimbursement for reasonable and necessary medical expenses for one who is injured on the job. Your Employer shall provide payment for reasonable surgical and medical services, services rendered by physicians or other health care providers, medicines and supplies as needed. However, these payments could be delayed, or even denied, if you do not notify us immediately of your injury or illness. If your claim is denied, you have the right to request a hearing before a workers' compensation judge.

Additional general information (not including legal advice) can be obtained by contacting the Bureau of Workers' Compensation: 1) by mail at 1171 South Cameron Street, Room 103, Harrisburg, PA 17104-2501; 2) by phone at (800) 482-2383 (within PA) or (717) 772-4447 (outside PA) or (800) 362-4228 (for hearing & speech impaired individuals); or 3) via the internet at www.state.pa.us, PA Keyword: workers comp.

Your employer, in compliance with the Pennsylvania Workers' Compensation Act, as amended, has posted a list of at least (6) health care providers from which you are to select. This list is posted at various sites on the premises. You are required to visit one of the physicians or other health care providers so designated and shall continue to visit the same or another designated physician or health care provider for a period of ninety (90) days from the date of the first visit. Before seeking any treatment, be sure to check with the most current posted list of employer- designated health care providers. In addition, the following rights and duties under the Act are applicable:

1. The employee has the duty to obtain treatment for work-related injuries and illnesses from one or more of the designated health care providers for ninety (90) days from the date of the first visit to a designated provider.
2. The employee has the right to have all reasonable medical supplies and treatment related to the injury paid for by the employer as long as the treatment is obtained from a designated provider during the ninety (90) day period.
3. The employee has the right, during this ninety (90) day period, to switch from one health care provider to another provider on the list and that all of the treatment shall be paid for by the employer.
4. The employee has the right to seek treatment from a referral provider if the employee is referred to him by a designated provider, and the employer shall pay for the treatment rendered by the referral provider.
5. The employee has the right to seek emergency medical treatment from any provider but that subsequent non-emergency treatment shall be by a designated provider for the remainder of the ninety (90) day period.

Work Rules for all Field Forces – J.J. White, Inc.

6. The employee has the right to seek treatment, or medical consultation, from a non-designated provider during the ninety (90) day period, but that these services shall be at the employee's expense for the applicable ninety days. However, should invasive surgery be necessary for an employee be prescribed by a physician or other health care provider so designated by the employer, the employee shall be permitted to receive a second opinion from any health care provider of the employee's choosing. If the second opinion differs from the one provided by the physician or health care provider so designated by the employer, the employee shall determine which course of treatment is to be followed, provided that the second opinion includes a specific and detailed course of treatment. If the employee chooses to follow the procedures designated in the second opinion, such procedures shall be performed by one of the physicians or other health care providers so designated by the employer for a period of ninety (90) days from the date of the visit to the physician or other health care provider of the employee's own choice.
7. The employee has the right to seek treatment from any health care provider after the ninety (90) day period has ended and that treatment shall be paid for by the employer if it is reasonable and necessary.
8. After ninety (90) days from the date of the first treatment, the employee shall have the duty to notify the employer of treatment by a non-designated provider within (5) days of the first visit to that provider. The employer shall not be required to pay for treatment rendered by a non-designated provider prior to receiving this notification, if such services are determined, through utilization review, to have been unreasonable or unnecessary.
9. Also, please remember that prescription drugs and professional pharmaceutical services will only be reimbursed up to 100% of the average wholesale price of the product or service. Therefore, if you will be presenting a bill for payment or reimbursement of prescription drug or pharmaceutical services, please make sure that the pharmacy has charged you the proper amount as permitted under the Pennsylvania Workers' Compensation Act.

Your Signature on this form indicates that you have read the above and that you understand your rights and duties under the above provisions of the Pennsylvania Workers' Compensation Act.

I hereby acknowledge that I have been informed of, and understand, my rights and duties under the above provisions of the Pennsylvania Workers' Compensation Act, as amended and I have been provided a copy of the Panel Physician list for this worksite.

J. J. White, Incorporated Employee's Signature

Date

Print Name of J. J. White, Incorporated Employee



J. J. White, Incorporated
5500 Bingham St. Philadelphia, PA 19120

Phone (215) 722- 1000
Fax (215) 745-6229

To: All Employees of J. J. White, Incorporated working at a CUDAP governed facility
including:

Exelon Energy Company (Mid-Atlantic region)
PES Philadelphia
Honeywell – Frankford Facility

From: James J. White IV
President

Date: August 28, 1997

Revision Date: January 13, 2014

Subject: The Coalition for a Uniform Drug and Alcohol Program (“CUDAP”)

Please be advised that the above noted companies are members of the Coalition for a Uniform Drug and Alcohol Program (“CUDAP”). Because these companies are members of CUDAP , you are covered by CUAP’s uniform drug and alcohol policies.

More specifically, you are covered by CUDAP’s uniform drug and alcohol policies.

1. Drug and Alcohol Policy
2. Chemical Testing Policy
3. Search Policy

All three of these policies are posted at your worksite. Copies of them can also be obtained from me upon request.

Please review each of these policies carefully. It is important that you understand and comply with them. In particular:

1. The Drug and Alcohol Policy includes absolute prohibition with regard to the use, possession or other involvement with illegal drug or alcohol while working on the Project.
2. The Chemical Testing Policy requires testing for drugs and alcohol:
 - As a condition of and prior to your commencing work on the Project and periodically thereafter.

Work Rules for all Field Forces – J.J. White, Inc.

- For cause, e.g., if there is a reason to believe you are under the influence of drugs and/or alcohol or otherwise have used drugs and/or alcohol in violation of the CUDAP Drug and Alcohol Policy.
 - Post-accident, if your actions or inactions could have been a contributing cause.
 - By lottery, without individualized suspicion or supervisory discretion
3. The Search Policy makes clear that you, your belongings and work area are subject to search while on the Project.

You may be precluded from working on any subsequent CUDAP projects and your employment with J. J. White, Incorporated will terminate immediately if:

- You engage in conduct prohibited by the CUDAP Drug and Alcohol Policy.
- You test positive for drugs and alcohol.
- You refuse to submit and/or consent to testing when required.
- You provide a false or tampered urine specimen.
- You fail to submit to a search when required.
- The search results in the discovery of alcohol, drugs, or other contraband.
- You report to work while taking prescribed or over-the-counter medication which interferes with your ability to perform your job safely and you have not notified your supervisor in advance as required.

As noted previously, you are encouraged to review carefully the CUDAP policies which are posted at your worksite and which are obtainable upon request.

I thank you in advance for your cooperation and compliance.

ACKNOWLEDGEMENT OF RECEIPT:

J. J. White, Incorporated Employee's Signature

Date

Print Name of J. J. White, Incorporated Employee



NOTIFICATION AND CONSENT TO TESTING

Name of Employee: _____

Social Security Number: _____

Date: _____

J. J. White is committed to the goal of obtaining a drug and alcohol free workplace. Consistent with this goal, YOU ARE BEING REQUESTED TO SUBMIT TO TESTING AS FOLLOWS:

Type of Test:

☒

Alcohol

☒

Drug

Testing Circumstances:

☒

Pre-Employment

IF YOU HAVE A VERIFIED POSITIVE RESULT AND/OR FAIL OR REFUSE TO SUBMIT TO THIS TEST YOU WILL BE SUBJECT TO DISCIPLINE.

I hereby acknowledge receipt of this Notification of Testing and I hereby consent to give a breath and/or saliva alcohol sample and/or a urine specimen and also consent to the analysis of the breath and/or saliva alcohol sample and/or urine specimen for alcohol or drugs.

Signed: _____
Employee

Date

APPENDIX 15
FALL PROTECTION TRAINING GUIDE
FOR
PERSONAL FALL ARREST SYSTEMS



J. J. White, Inc.

Fall Protection Training Guide for Personal Fall Arrest Systems

I. Instruction to the Trainer and the Trainee

This training module is intended to instruct anyone who must use fall protection in the proper use, donning, inspection and maintenance of the full body harness and lanyard.

This module also contains a section on the Miller Rope Grab System. If this system is not going to be used, it is not necessary to include this section in the training.

A demonstration of the donning and doffing techniques is useful in ensuring that everyone understands the proper use of these harnesses.

II. Categories of Fall Protection

A. Fall Arrest (Personal Protective Equipment)

1. J. J. White, Incorporated requires a Fall Arrest System whenever there is a risk that a worker may fall from an elevation position 6 feet or more to a lower level. Follow client guidelines if their policy is more stringent.
2. Those workers situated on a standard work platform with a top rail at 42" (+/- 3"), and a mid rail at 21" (+/- 3"), and a 4" toe plate require no additional fall protection.
3. Working height is defined as the distance from a walking/working surface to a grade or lower level.
4. A fall arrest system is designed to be passive. That is, it should remain slack and should not be used to restrain oneself from a fall. It should only come into service when a fall occurs. Only position devices are designed to restrain a worker from a fall.

5. Personal Fall Arrest Systems can be further divided into four separate components, as follows:
 - a. Full Body Harness – All personnel are required to wear a full body harness. Safety belts are NOT an acceptable form of fall protection.
 - b. Shock Absorbing Lanyard – A Shock Absorbing Lanyard with double locking snap hooks is also required. Lanyards must have a shock-absorbing feature to reduce the arrest forces exerted on the body. Only lanyards with double locking snap hooks are acceptable. Double locking snap hooks prevent accidental “roll out.”
 - c. Anchorage- This is perhaps the most important component, because of our constant need to identify new anchorage points as our work progresses. Special care is needed as we choose new anchorage sites on which our lives might depend. The following are some guidelines to be used in selecting a proper anchorage point for fall protection:
 1. Anchor points must be capable of supporting 5,000 lbs. per worker, or 2,520 lbs. per worker if maximum fall potential is 6’ or less and a full body harness and shock absorbing lanyard are being used.
 2. Whenever possible, work directly under your anchor point to avoid a swing-fall injury.
 3. Never wrap a lanyard around sharp or rough edges or surfaces. Use of a Miller Cross-Arm Strap is required. Cross-Arm Straps have a “D” ring sewn into each end of the strap, one ring being smaller than the other so that the strap may be “choked.”
 4. Never “choke” a lanyard or snap the hook back onto the lanyard rope or webbing.
 5. Ensure that the anchor point is at a height that limits free fall distance to no more than 6 feet. Generally, 3” to 4” schedule 40 or greater pipe, or 3” to 4” structural member (i.e., Channel, I-Beam or Angle) may be used as an anchorage point. Never use Conduit, Cable Tray, Scaffold Crossbars or Handrails as Anchorage points.

- d. Robe Grab System – The Miller Rope Grab System is designed to protect a worker from falls while allowing complete freedom from movement vertically and to a lesser degree, some freedom of movement horizontally. The Rope Grab moves freely up and down a 5/8" or 3/4" diameter synthetic (either nylon or polyester) lifeline, yet will lock instantly when a fall occurs.

The Rope Grab is to be only used with a lifeline that is independent of the swing scaffold or Bosuns Chair if you are so situated. It is essential that the lifeline be secured independent from the rigging that supports your suspended or swing scaffold. Only one person may attach a rope grab to a lifeline.

The criteria used for anchorage selection for lifeline/ rope grab systems are the same criteria described above in the Anchorage section.

In addition, knots should never be used for a terminal anchorage connection. Rather an eye should be spliced in the end of the lifeline and shackled a cross-arm strap. A minimum of (6) tucks should be taken on synthetic rope eye splices.

To install a Miller Rope Grab on the lifeline the following procedure is to be followed:

1. Unscrew the large headlock screw to completely disengage the threads. At this point the spring will push the screw out to clear the cover lock plate.
2. Pull down on the screw to a 90-degree position. This disengages the lock plate and allows the assembly to be opened.
3. Place the rope grab on the life line with the arrow pointing "UP," close the lock plate and tighten the lock screw firmly. Never attach the lifeline with the "UP" arrow pointing downward. In this condition, the device will not lock into the rope if a fall occurs.
4. To reposition the rope grab, simply lift upward on the spring-loaded handle that connects the gripping cams.

B. Retrieval

1. Vertical entry into confined spaces requires the use of some type of retrieval device used in conjunction with a full body harness. J. J. White, Inc. uses a Tripod Retrieval System with a removable hand crank device.
2. Vertical entry into confined spaces often requires a descent of considerable distance. In this instance, fall protection also becomes a concern.
3. The retrieval device used for confined spaces also provides fall protection. Each device has the convenient feature of automatically paying out cable as you descend, but instantly locks in place should a fall occur.
4. Should an entrant require retrieval either because of a fall, exposure to a contaminant or inability to self-rescue, the retrieval device handle is simply cranked to raise the individual to the access point.

III. Inspection and Maintenance

A. Harness and Rings

1. While holding the body side of the belt or harness strap toward you, bend the strap into a “U” shape and examine the entire length of the harness strap or belt.
2. Check “D” rings for any distortion, cracks, breaks or rough, sharp edges. The “D” ring should pivot freely.
3. Attachment buckles should be checked for any unusual wear, frayed or cut fibers, or distortion of buckles.
4. Friction and Mating Buckles – again, inspect the buckles for distortion. The outer bars must be straight and center bar must be straight and parallel.

B. Lanyard Inspection

1. When inspecting lanyards, begin at one end and work your way to the other end. Rotate the lanyard so that the entire circumference is checked. Pay close attention to spliced ends.
2. Web lanyards can be bent over a piece of pipe or handrail. This will reveal any cuts or breaks. Examine both sides, paying close attention to the stitching and for any signs of charring, an indication of heat exposure.

C. Hardware- Snaps and Thimbles

1. Inspect the hook and eye closely for any distortion, cracks, corrosion, pitting or evidence of contact with a welding electrode. The keeper should seat into the nose without binding.
2. The keeper spring should exert enough force to firmly close the keeper.
3. Thimbles must be firmly seated in the eye of the splice and the splice should have no loose or cut strands.

IV. Proper Wearing of a Full Body Harness

In order for a full body harness to work properly in the event of a fall, it is important to know the proper method of wearing and adjusting the harness.



**J. J. White, Incorporated
Fall Protection Training Guide for
Personal Fall Arrest Systems**

By my signature below, I acknowledge having received training on the topic (s) listed.

Print Name _____

Sign Name _____

Craft _____

Date _____

Instructor _____

Last 4 digits of Employee Social Security # _____

APPENDIX 16

Lead Safety and Health Program

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I. Purpose and Scope

This program establishes procedures for the implementation of a Lead Safety and Health Program as required by the Occupational Safety and Health Administration's (OSHA's) Construction Industry Standard 29 CFR 1926.62. Compliance with the provisions outlined in the following section is mandatory for all J. J. White employees to ensure the protection of workers' health and adherence to federal regulations.

The purpose of implementing the Lead Safety and Health Program is to protecting the health of employees and minimize the risk of lead poisoning.

II. Responsibilities

A. Management

1. Comply with all applicable standards.
2. Promptly abate identified hazards. Where applicable, all hazards shall be eliminated or minimized through engineering or administrative controls. When these controls are not feasible, personal protective equipment will be provided at company expense.
3. Implement a comprehensive medical surveillance program.
4. Utilize performance evaluations reflecting personal accountability for safety and health.
5. Provide appropriate training through the Lead Safety and Health Program and seminars.

B. Employees

1. Read and comply with all the procedures in the company Lead Safety and Health Program.
2. Report any unsafe conditions to the appropriate supervisor or manager.

III. Background

Workers have used lead for thousands of years. In the construction industry, most over-exposures to lead have been found in the trades, such as plumbing, welding and painting.

In building construction, lead is frequently used for roofs, cornices, tank linings, and electrical conduits. In plumbing, soft solder, used chiefly for soldering tinplate and copper pipe joints, is an alloy of lead and tin. Soft solder, in fact, has been banned for many uses in the United States.

The use of lead-based paint in residential application has also been banned. However, since lead-based paint inhibits the rusting and corrosion of iron and steel, it is still used on bridges, railways, ships, lighthouses, and other steel structures, although substitute coatings are available.

Lead exposures can also arise from removing paint from surfaces previously coated with lead-based paint, such as in bridge repair, residential renovation, and demolition. The trades potentially exposed to lead include iron work, demolition work, painting, lead-based paint abatement work, plumbing, heating/air-conditioning, electrical work, and carpentry/renovation/remodeling.

Operations that generate lead dust and fume including the following:

- Flame-torch cutting, welding, the use of heat guns, sanding, scraping, and grinding of lead painted surfaces in repair, reconstruction, dismantling, and demolition work;
- Abrasive blasting of bridges and other structures containing lead based paints;
- Use of torches and heat guns, and sanding, scraping, and grinding lead-based paint during remodeling or abating lead-based paint; and
- Maintaining process equipment or exhaust ductwork.

Employers of construction workers are responsible for the development and implementation of a worker protection program in accordance with 29 CFR 1926.20 and 29 CFR 1926.62(e). This program is essential in minimizing worker risk of lead exposure. Construction projects vary in their scope and potential for exposing workers to lead and other hazards. Many projects may involve limited exposure, such as the removal of paint from a few interior residential doors. Others may involve the removal or stripping of substantial quantities of lead-based paints on large bridges.

The most effective way to protect workers is to minimize exposure through the use of engineering controls and good work practices. It is OSHA policy that respirators are not to be used in lieu of engineering and work practices to reduce employee exposures to below the PEL. Respirators may be used only in combination with engineering controls and work practices to control employee exposures.

OSHA's new interim final standard for lead in construction limits worker exposures to 50 micrograms of lead per cubic meter (g/m³) of air averaged over an eight-hour workday.

The following elements are included in the Lead Safety and Health Program:

- Hazard determination, including exposure assessment;
- Engineering and work practice controls;
- Respiratory protection;
- Protective clothing and equipment;
- Housekeeping;
- Hygiene facilities and practices ;
- Medical surveillance and provisions for medical removal;
- Training;
- Signs; and
- Recordkeeping.

To implement the worker protection program properly, a competent person, defined as someone capable of identifying existing and predictable hazards or working conditions, which are hazardous or dangerous to employees, in accordance with the general, safety, and health provisions of OSHA's construction standards, will be designated for each project. The competent person will have the authorization to take prompt corrective measures to eliminate such problems. Qualified medical personnel will be available as required to advise the management and employees on the health effects of employee lead exposure and supervise the medical surveillance program.

IV. Hazard Determination/Exposure Assessment

Management is responsible for initially determining if any employees may be exposed at or above the action level of 30 /m³ measured as an 8-hour TWA. An initial exposure assessment is required for each project where lead or lead containing materials are being used, disturbed, or removed.

A full shift of personal sampling data will be collected including one sample from each job classification in each work area for each shift or for the shift with the highest exposure level. Until the exposure assessment is performed, management will provide the following to all pertinent employees: respiratory protection, personal protective clothing and equipment, adequate change areas, hand washing facilities, biological monitoring, and training in accordance with 29 CFR 1926.62. The level of respiratory protection provided until the assessment is complete shall be determined by a qualified health and safety professional, such as an industrial hygienist.

Whenever there has been a change of equipment, process control, personnel or a new task has been initiated that may result in additional employees being exposed to lead at or above the action level, management will conduct additional monitoring in accordance with OSHA regulations. Within 5 working days after the completion of the exposure assessment the employer shall notify each employee in writing of the results that represent that employee's exposure.

V. Engineering Controls

Because lead is a cumulative and persistent toxic substance and because lead- caused health effects may results from low level of exposure over prolonged periods or time, engineering controls and good work practices shall be used where feasible to minimize employee exposure to lead. Exposures will not exceed the OSHA interim final PEL of 50 micrograms per cubic meter of air (g/m³) averaged over an 8-hour period. When feasible engineering controls and work practice controls cannot reduce worker exposure to lead to at or below 50 g/m³, respirators will be used to supplement the use of engineering and work practice controls.

A competent person will review all site operations and stipulate the specific engineering controls and work practices designed to rescue worker exposure to lead.

Engineering measures include local and general exhaust ventilation, process and equipment modification, material substitution, component replacement, and isolation or automation. Examples of recommended engineering controls that can be used to reduce employee exposure to lead are as follows:

A. Exhaust Ventilation

Power tools used for the removal of lead-based paint should be equipped with dust collection shrouds or other attachments exhausted through a high-efficiency particulate air (HEPA) vacuum system. Operations such as welding, cutting/burning, heating should be provided with local exhaust ventilation. HEPA vacuums should be used during clean-up activities.

For abrasive blasting operations where a full containment exists or is required, the containment structure should be designed to optimize the flow of ventilation air past the worker (s), so that the airborne concentration of lead is reduced and the visibility is increased. The affected area should be maintained under negative pressure to reduce the chances that lead dust would contaminate areas outside the enclosure. A containment structure should be equipped with dust collection and an air-cleaning device to control emissions of particulate matter to the environment.

B. Enclosure/Encapsulation

Lead-based paint can be made inaccessible either by encapsulating it with a material that bonds to the surface, such as acrylic or epoxy coating or flexible wall coverings, or by enclosing it using systems such as gypsum wallboard, plywood paneling, and aluminum, vinyl or wood exterior siding. Floors coated with lead-based paint can be covered using vinyl tile or linoleum flooring.

The designated competent person will oversee the project with regard to all activities that involve enclosed or encapsulated lead-based paint. This will minimize potential inadvertent release of lead during maintenance, renovation, or demolition.

C. Substitution

Zinc-containing primers covered by an epoxy intermediate coat and polyurethane topcoat can be used instead of lead-containing coatings.

Mobile hydraulic shears can be substituted for torch cutting under certain circumstances.

Surface preparation equipment, such as needle guns with multiple reciprocating needles completely enclosed with an adjustable shroud, can be substituted for abrasive blasting under certain operations. The shroud captures dust and debris at the cutting edge and can be equipped with a HEPA vacuum filtration system with a self-drumming feature.

Chemical strippers used primarily on the exterior of the buildings, surfaces involving carvings or moldings, or intricate iron works, can be used in place of hand scraping using a heat gun. Chemical removal generates less airborne lead dust.

These strippers, however, can be hazardous and the material safety data sheets (MSDS) for the products used will be reviewed by management for information on worker exposure hazards from the chemical ingredients and protective measures recommended by the manufacturer.

D. Component Replacement

Lead-based painted building components (i.e. windows, doors, and trim) can be replaced either with new components free of lead-containing paint or with the same components after the paint has been removed off-site. Replacement is a permanent solution.

E. Process/Equipment Modification

Brush/roller application of lead paints or other lead-containing coatings is a safer method than spraying. (Note: There is a ban on the use of lead-based paint in residential housing.) This method of application introduces little or no paint mist into the air where the mist can present a lead inhalation hazard.

Non-silica containing abrasive (e.g., steel or iron shot/grit) shall be used where practical instead of sand in abrasive blasting operations. The free silica portion of the dust presents a respiratory health hazard.

Blasting techniques that are less dusty than abrasive blasting and that can be effective under some conditions include: (1) hydro- or wet-blasting (using high pressure water with or without abrasive or surrounding the blast nozzle with a ring of water), and (2) vacuum blasting where a vacuum hood for material removal is positioned around the exterior of the blasting nozzle.

Heat guns used to remove lead-based paints in residential housing units shall be of the flameless electrical softener type and shall be equipped with various nozzles to cover all common applications and to limit heating the work area.

When abrasive blasting with vacuums on exterior building surfaces, care shall be taken that the configuration of the heads on the blasting nozzle match the configuration of the substrate so that the vacuum is effective in containing debris.

When HEPA vacuum cleaners are used to clean surfaces other than floors, operators will have attachments appropriate for use on unusual surfaces. The proper use of brushes of various sizes, crevice tools and angular tools, when needed, will enhance the quality of the HEPA-vacuuming process and help reduce the amount of lead dust released into the air.

F. Isolation

Although it is not feasible to completely enclose and ventilate some abrasive blasting operations, it is possible to isolate many operations to help reduce the potential for exposure to lead. Management will assure that employees not involved in the blasting operations will be kept as far away as possible from the work area. By placing the employees at a greater distance from the source of lead exposure, their exposures will be reduced.

VI. Housekeeping and Personal Hygiene Practices

Lead is a cumulative and persistent toxic substance that poses a serious health risk. A rigorous housekeeping program and adherence to basic personal hygiene practices will minimize employee exposure to lead. In addition, these two elements of the worker protection program will help to prevent taking lead-contaminated dust out of the worksite and home to the workers' families, thus ensuring that the duration of lead exposure does not extend beyond the work shift and providing added protection to employees and their families.

A. Housekeeping

Management will ensure daily removal of accumulations of lead dust and lead-containing debris from the work area. Control measures such as vacuuming lead dust with high-efficient particulate air (HEPA) – filtered equipment or wetting it with water before sweeping will be employed to minimize lead exposure. Cleaning operations shall be conducted, whenever possible, at the end of the day, after normal operations cease. All persons doing the cleanup shall be provided with suitable respiratory protection and personal protective clothing to prevent contact with lead.

All lead-containing debris and contaminated items accumulated for disposal will be collected and put into sealed impermeable bags or other closed impermeable containers. Bags and containers will be appropriately labeled as lead-containing waste. These measures are especially important as they minimize additional sources of exposure that engineering controls generally are not designed to control.

B. Personal Hygiene Practices

To minimize exposure to lead, special attention will be given to workers' personal hygiene. Management will provide and ensure that workers use washing facilities. Clean change areas, and separate non-contaminated eating areas must also be provided. Cars will be parked where they will not be contaminated with lead. These measures will reduce the workers' period of exposure to lead and ingestion of lead, ensure that the duration of lead exposure does not extend beyond the work shift, significantly reduce the movement of lead from the worksite, and provide added protection to employees and their families.

Change Areas: Management shall provide a clean change area equipped with storage facilities for street clothes and a separate area with facilities for the removal and storage of lead-contaminated protective work clothing and equipment.

Clean change areas will be used for taking off street clothes, suiting up in clean working clothes (protective clothing), donning respirators prior to beginning work, and dressing in street clothes after work. No lead-contaminated items are permitted to enter this area.

Employees are not permitted to wear work clothes away from the job site. Under no circumstances shall lead-contaminated work clothes be laundered at home or taken from the worksite, except to be laundered professionally or properly disposed of following applicable Federal, state, and local regulations.

Showers: When the potential exists for extensive contamination of the employees' skin, hair and protective clothing, shower facilities will be provided, if feasible, so that exposed employees can wash lead from their skin and hair prior to leaving the worksite. Where showers are provided, employees will change out of their work clothes and shower before changing into their street clothes and leaving the worksite.

Workers will be informed that if they do not change into clean clothing before leaving the worksite, they may contaminate their homes and automobiles with lead dust. Other members of the household may then be exposed to harmful amounts of lead.

Personal Practices (eating, drinking, etc.): Management shall ensure that employees who work with lead either clean or remove their protective clothing and wash their hands and face prior to eating, drinking, smoking or applying cosmetics and that these latter practices are never permitted while in the work area or in areas subject to the accumulation of lead. HEPA vacuuming can be used to remove loose contamination from the work clothing prior to eating.

Washing Facilities: Adequate washing facilities shall be provided for employees. Such facilities shall be in near proximity to the worksite and provided with water, soap, and clean towels to enable employees to remove lead contamination from their skin.

Contaminated water from washing facilities and showers will be disposed of in accordance with applicable local, state, or federal regulations.

End-of-Day Procedures: Workers who are exposed to lead will follow these procedures upon finishing work for the day:

1. Place disposable coveralls and shoe covers with the lead waste;
2. Place lead- contaminated clothes, including work shoes, and personal protective equipment for laundering/cleaning (by the employer) in a closed container.
3. Take a shower and wash hair; and
4. Change into street clothes.

VII. Protective Clothing

Management will provide clean, dry protective work clothing and equipment to workers who are exposed to lead above the PEL and for whom the possibility of skin contamination or skin or eye irritation exists. Appropriate changing facilities will also be provided. Appropriate protective work clothing and equipment used on construction sites will include:

- Coveralls or other full-body work clothing;
- Gloves;
- Vented goggles or face shields with protective spectacles or goggles; and
- Welding or blasting helmets, when required

Disposable coveralls and separate shoe covers may be used, if appropriate, to avoid the need for laundering. Non-disposable coveralls shall be replaced daily. If an employee leaves the work area wearing protective clothing, the clothing should be cleaned with high-efficiency particulate air (HEPA) filter vacuum equipment to remove loose particle contamination; or as an alternative, the coveralls should be removed. Before respirators are removed, HEPA vacuuming or other suitable method, such as damp wiping, shall be used to remove loose particle contamination on the respirator and at the facemask seal.

Contaminated clothing that is to be cleaned, laundered or disposed of shall be placed in closed containers. Containers shall be labeled with the following warning:

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.

Employees responsible for handling contaminated clothing shall be informed of this potential hazard in writing. At no time shall lead be removed from protective clothing or equipment by any means that disperses lead into the work area, such as brushing, shaking, or blowing.

At no time shall workers be allowed to leave the worksite wearing lead contaminated clothing or equipment, e.g. shoes, coveralls, or headgear.

All contaminated clothing and equipment shall be prevented from reaching the worker's home or vehicle. This is an essential step in reducing the movement of lead contamination from the workplace into a worker's home and provides added protection to employees and their families.

Gloves and protective clothing should be appropriate for the specific chemical exposure (e.g. solvents and caustics). Cotton gloves provide some protection against the contamination of hands and cuticles with lead dust. Workers will wear clothing that is appropriate for existing weather and temperature conditions under the protective clothing.

Heat stress: Workers wearing protective clothing can face the risk of heat stress. Additionally, heat stress may be an important concern when working in a hot environment or within containment structures. Heat stress is caused by a number of interactive factors, including: environmental conditions, type of protective clothing worn, the work activity required, and the individual characteristics of the employee.

In situations where heat stress is a concern, employees will be informed of appropriate work/rest regimens and management will provide heat stress monitoring that includes measuring employee's heart rates, body temperatures, and weight loss. A source of water or electrolytic drink shall be close to the work area (in a non-contaminated eating/drinking area) so that it will be used often. Workers will wash their hands and face prior to drinking any fluid.

VIII. Respiratory Protection

Although engineering and work practice controls are the primary means of protecting workers, source control at construction sites is often not sufficient to control exposure, and airborne lead concentrations may be high or may vary widely.

Respirators must often be used to supplement engineering controls and work practices whenever these controls are technologically incapable of reducing worker exposures to lead to or below 50 g/m³.

To provide adequate respiratory protection, respirators will be donned before entering the work area and will not be removed until the worker has left the area, or as part of a decontamination procedure. Management will assure that the respirator issued to the employee is properly selected and properly fitted so that it exhibits minimum face piece leakage. Respirators will be supplied at no cost to employees. Qualitative or quantitative fit tests will be performed at the time of the initial fitting and at least semiannually thereafter.

- A. RESPIRATOR PROGRAM: When respirators are provided, a respirator protection program in accordance with the OSHA standard on respirator protection, 29 CFR 1910.134 will be implemented.

Minimum requirements for an acceptable respirator program for lead include the following elements:

- Written standard operating procedures governing the selection and use of respirators;
- Selection of respirators on the basis of hazards to which the worker is exposed;
- Instruction and training in the proper use of respirators and their limitations;
- Regular inspection and cleaning, maintenance and disinfection; worn or deteriorated parts must be replaced, including replacement of the filter element in an air-purifying respirator whenever an increase in breathing resistance is detected.
- Storage in a convenient, clean, and sanitary location and protection against sunlight and physical damage;
- Appropriate surveillance of work area conditions and degree or worker exposure or stress (physiological or psychological) must be maintained;
- Evaluation to determine the continued effectiveness of the program;
- Physician's determination that the employee is physically able to perform the work and wear a respirator while performing the work (respirator user's medical capacity to wear and work with a respirator should be reviewed annually);
- Use of Mine Safety and Health Administration/National Institute for Occupational Safety and Health (MSHA/NIOSH) certified respirators;
- Fit testing of negative-pressure respirators;
- Breathing air used for supplied-air respirators must meet the requirements prescribed in 1910.134(d)(1); and
- Standing permission for employees to leave the work area to wash their faces and respirator face pieces whenever necessary to prevent skin irritation associated with respirator use.

- B. RESPIRATOR SELECTION: Lead concentrations may vary substantially throughout a work shift as well as from day-to-day. The highest anticipated work concentration is to be used in the initial selection of an appropriate respirator.

If exposure monitoring or experience indicates airborne exposures to contaminants other than lead, such as solvents or polyurethane coatings, these exposures must be considered when selecting respiratory protection. A reevaluation of the respiratory protection program is required when a worker demonstrates a continued increase in blood lead levels.

- C. ABRASIVE BLASTING AND RELATED OPERATIONS: Abrasive- blasting operators must wear NIOSH type CE respirators. NIOSH certifies continuous flow and positive pressure respirators for abrasive blasting operations. The continuous-flow respirators are recommended by NIOSH for airborne concentrations less than or equal to 25 times the OSHA PEL of 50 g/m³. Positive pressure respirators are recommended by NIOSH for airborne concentration less than 2,000 times the OSHA PEL (50 g/m³). Furthermore, manufacturer's instructions regarding quality of air, air pressure, and inside diameter and length of hoses must be strictly followed. Use of longer hoses or smaller inside diameter hoses than the manufacturer's specifications, or hoses with bends or kinks may restrict the flow of air to a respirator.

IX. Medical Surveillance

When employee is exposed to lead at or above the action level of 30 g/m³ on any one day in a calendar year, management shall provide the employee with an initial medical surveillance consisting of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels.

Workers potentially exposed to lead at or above the action level will be monitored for the presence of lead in the blood and the effect of lead on the blood-forming system. Medical surveillance will be provided to employees exposed to lead at or above the action level for more than 30 days per year. All medical examinations and consultations shall be performed by or under the direct supervision of a qualified physician and shall be provided to employees at no cost, without loss of pay, and at a reasonable time and place. A qualified physician is a doctor of medicine (M.D.) or osteopathy (D.O.) familiar with the objectives and requirements of a medical surveillance program for lead exposure.

Management will assure employees receive an immediate medical consultation including, a physical examination and biological monitoring if: (1) a worker develops signs or symptoms associated with lead toxicity; and (2) before a worker restarts work following medical removal.

A. Biological Monitoring

The purpose of biological monitoring is to identify workers with elevated blood lead levels. The data from biological monitoring is objective evidence of a worker's body burden from lead exposure and this data can be used to follow changes in worker exposure.

Blood lead and zinc protoporphyrin (ZPP) or free erythrocyte protoporphyrin (FEP) shall be monitored for those workers exposed to lead. Workers in high-risk occupations will be monitored as often as needed to prevent adverse health effects. A laboratory currently accredited to perform such work shall conduct all analysis of blood samples.

B. Reproductive Hazard Issues

Lead is toxic to both male and female reproductive systems. Workers who are actively seeking to have a child or who are pregnant shall contact qualified medical personnel to arrange for a job evaluation and medical follow-up. If employees contact management with concerns about reproductive issues, they must refer them to qualified medical personnel.

C. Written Medical Opinion

Management will obtain a written signed opinion from the examining physician for each medical examination performed for each employee. This opinion will contain the results of the medical examination as they relate to occupational exposure to lead and will include:

- A detailed work history;
- Whether the employee has any detected medical condition which would place his/her health at increased risk from lead exposure;
- Any special protective measures or limitations on worker's exposure to lead;
- Any limitation on respirator use;
- Results of blood lead determination; and
- A statement that the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment as informed the employee.
- Findings of lab results or diagnoses unrelated to the workers' exposure to lead couldn't be communicated to management or included in a written opinion.

Each physician of any medical condition, occupational or non-occupational, which necessitates further medical evaluation or treatment, will advise employees. Management will furnish the employee with a copy of the written medical opinion.

D. Chelation

The use of chelating drugs as a prophylactic measure (i.e. to prevent a detectable rise in blood lead) is an unacceptable medical practice. Chelation will be used by a qualified physician only for diagnostic or therapeutic reasons (that is, to diagnose or treat the signs and symptoms of severe lead toxicity).

E. Medical Removal

Medical removal will protect worker health both by stopping further occupational exposure and by enabling the worker to excrete the absorbed lead naturally. With good engineering, work practices, personal hygiene, and respiratory protection practices in place, no employees should reach the medical removal trigger level of 50 g/dl specified in the OSHA standard.

If employees must be removed, or otherwise limited, they will be placed in jobs that will not result in exposure to lead at or above the action level of 30 g/m³ for two consecutive tests.

The employee may return to his or her former job status only after a qualified physician determines that the employee is no longer at risk from exposure to lead or when the employee's blood lead level drops below 40 g/dl for two consecutive tests.

Medical removal record will include the following information:

- The name and social security number of the worker.
- The date of each occasion that the worker was removed from current exposure to lead
- The date on which the worker was returned to his or her former job status
- A brief explanation of how each removal was or is being accomplished; and
- A statement indicating whether or not the reason for the removal was an elevated blood lead level.

Management will maintain this record for at least the duration of any worker's employment.

X. Training

Management shall assure that each employee is trained in the following:

- The content of the OSHA Standard and its appendices
- The specific nature of the operations which could result in exposure to lead above the specific action level
- The purpose, proper selection, fitting, use, and limitations of respirators.
- The purpose and a description of the medical surveillance and the medical removal protection program.
- The engineering controls and work practices associated with the employee's job assignment
- The contents of any project safety and health plan
- Instructions to employees that chelating agents should not routinely be used to removed lead from their bodies and should not be used except under the direction of a licensed physician.
- The employees right of access to record under 29 CFR 1910.20

XI. Signs

Warning signs will be posted in each work area where employees exposure to lead is above the PEL. The signs will be illuminated and cleaned as necessary so that the legend is readily visible.

All posted signs required by other statutes, regulations or ordinances in addition to, or in combination with signs required by OSHA shall not contradict or detract from the meaning of the required sign.

XII. Recordkeeping

Management will maintain any employee exposure and medical records to document ongoing employee exposure, medical monitoring and medical removal of workers. This data provides a base to properly evaluate employee's health.

Cases will be recorded on the OSHA Form 300 when the worker:

- Has a blood lead level that exceeds 50 g/dl;
- Has symptoms of lead poisoning, such as colic, nerve damage, renal damage, anemia, or gum problems; or
- Receives medical treatment to lower blood lead levels or for lead poisoning.

APPENDIX 17

OSHA INSPECTION PROTOCOL



J. J. White, Inc.

OSHA Inspection Protocol

OSHA Inspections are a serious matter, and when they occur, must be handled in a professional and concise manner.

As the Superintendent, you will most likely be the first, and initially the only person of authority, representing J. J. White, Inc. upon the OSHA inspector's initial arrival at a given job site. It is of paramount importance that you adhere to the following protocol when such a situation arises.

PROTOCOL

- I. Identify the individual representing himself or herself as the OSHA inspector. This is done by simply requesting that the individual present their OSHA identification badge (or business card) and one other form of identification, preferably with a picture. This procedure is done PRIOR to allowing the inspector onto the job site.
- II. After proper identification of the OSHA inspector has been established, lead him or her immediately to your office area or trailer. You will now advise the OSHA inspector that you must contact the main office to assemble the J. J. White, Incorporated OSHA inspection team. Advise the inspector further, that this team or group of J. J. White, Incorporated management personnel are the company individuals specifically designated to provide all needed information, which the inspector may require, or request.

Assembling the team should take approximately 1 hour or less, and the OSHA inspector should be advised of this time requirement. Thus you will have to request the inspector to wait in the trailer/ office area until such time as the group is assembled and has arrived on site. The inspector should view this as a reasonable request.

During this time (when you are awaiting the arrival of the inspection group), you are to keep the OSHA inspector at the trailer/office area, without exception. Additionally, do not discuss the project with the inspector in any manner. If for any reason the OSHA inspector deems the time period requested to assemble the inspection group unreasonable, or refuses to wait in the trailer/office area for the arrival of the inspection group, you can decline the inspection of the job site at this time, and promptly walk the OSHA inspector completely off of the job site. If this occurs, contact and inform the inspection team immediately.

To assemble the J. J. White, Incorporated inspection team, simply call the main office (215) 722 – 1000, and request the operator to do so. Be sure to identify yourself, and your current job site location.

- III. Once the main office has been contacted, the operator will immediately be notifying the inspection group of the situation. This group will consist of the following J. J. White, Incorporated personnel:

James Daley – President
Steve Abate – EVP Operations
Bill Nolan- Risk Manager
Mike Ryan – VP Health,Safety,
Environment

Additionally, this group will attempt to contact one or more business agents of the Union Locals whose members are most prevalent on the project site being inspected, so as to include these individuals in the inspection group. **Use Form Titled “Identification of Inspection Group” included in this section.**

- IV. Upon the arrival of the J. J. White, Incorporated inspection group, and after their introduction to the OSHA Inspector, the group will expand its membership to also include a representative of each of the Subcontractors currently engaged in work on the project site. Be sure to add each additional Inspection Group Member’s identification to the **“Identification of Inspection Group”** form discussed above.

Then, and only then, will the group request the OSHA Inspector to define the scope, in detail, of his/her inspection of the project. In addition to the group members, you the Superintendent, are to take specific notes of all items announced by the OSHA Inspector for inspection. **Use Form Titled “Scope of OSHA Inspection”, included in this section.**

- V. Once the OSHA Inspector has announced the complete scope of his inspection, the inspection will then begin. All work at the project site will now be stopped and the OSHA Inspector will, at all times while on the project site, be accompanied by the Superintendent and all members of the J. J. White, Incorporated inspection group. Note the OSHA Inspector’s access to the job site is limited to the areas of the job site based on his or her defined inspection scope.

Again, notes must be taken by each individual regarding any and all items addressed or discussed by the OSHA Inspector. Any pictures taken by the OSHA Inspector will have a duplicate photograph taken by the inspection group. **Use Form Titled “Items Addressed during OSHA Inspection”, included in this section.**

- VI. The OSHA Inspector has the right, during the inspection, to question any one of, or all of the employees on the project site. This includes not only J. J. White, Incorporated personnel, but any subcontracted employee as well. At this time the Inspection Group should ask the employee, if he or she would like the Group Member to represent them during the questioning. (Thus allowing the Group Member to answer the question on his or her behalf, a J. J. White, Inc. member is a J. J., White, Inc. employee, OR a Subcontractor member, if a Subcontracted employee).

Additionally, the employee should be advised that it is quite within his or her right to refuse to answer any question or questions the OSHA Inspector can ask the employee if he or she so chooses not to answer, OR simply decline the interview entirely. However, if the employee does choose to hold a discussion with the OSHA Inspector, takes notes of all questions and responses Note: most OSHA Inspectors will tape record the interview, if permission is given to do so. **Use Form Titled “Items Addressed During OSHA Inspection”, included in this section.**

- VII. Upon the completion of the inspection, as determined by the OSHA Inspector, a closing conference will be conducted. This meeting will take place on the project site in the established trailer/office area. At this time, all group members, including the Superintendent, must be in attendance. This meeting will be conducted for the purpose of documenting each and every item addressed by the OSHA Inspector during the inspection, including making additional notes on any interview conducted. At the end of this meeting, a specific date should be obtained from the OSHA Inspector, as well as a time frame upon which his/her initial findings will be made known to all parties involved. Once this information is obtained, the inspection is considered completed, and the OSHA Inspector is to be walked off of the project site by at least two of the inspection group members. **Use Form Titled “OSHA Inspection Conclusion Meeting”, included in this section.**

- VIII. The assembled Inspection Group will now compare all findings from each member, and schedule a mutually convenient time to reconvene to further discuss the outcome of the inspection. A plan for further action will be determined at this time, as warranted. It should be noted that as a matter of OSHA policy, the OSHA Inspector returns all information to the OSHA Area Director and it is he/ she whom issues any fines or citations.



J. J. White, Inc.

Identification of Inspection

Project Site/ Location: _____

Superintendent: _____

Job Number: _____

Date: _____

| Name | Title | Company | Social Security Number | Signature |
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OSHA Inspector(s) Information Table

| Name | Title | Company | Social Security Number | Signature |
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| | | | | |
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| | | | | |



J. J. White, Inc.

Scope of OSHA Inspection

Project Site/ Location: _____

Superintendent: _____

Job Number: _____

Date: _____

| Item Number | Identification of Individual Item, or General area to be Included within Scope | Specific reason for Item or Area being Inspected | Notes |
|-------------|--|--|-------|
| 1. | | | |
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J. J. White, Inc.

Items Addressed During OSHA Inspection

Project Site/ Location: _____

Superintendent: _____

Job Number: _____

Date: _____

Page 1 of 2

| Item Number | Identification of Individual, Specific Item, or Area Actually Inspected | OSHA Inspectors Comments | Pictures or Recorded Statement taken? Notes |
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OSHA Inspection Protocol – J.J. White, Inc.

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Page 2 of 2

Additional Notes:



J. J. White, Inc.

OSHA Inspection Conclusion Meeting

Project Site/ Location: _____

Superintendent: _____

Job Number: _____

Date: _____

Page 1 of 2

| Item Number | Identification of Specific Item Discussed | Notes |
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OSHA Inspection Protocol – J.J. White, Inc.

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Page 2 of 2

Additional Notes:

APPENDIX 18

POWERED INDUSTRIAL TRUCK SAFETY



J. J. White, Inc.

Powered Industrial Truck Safety

In December of 1998, OSHA (the Occupational Safety and Health Administration) issued a revised standard for operator training and the operation of Powered Industrial Trucks, one class of which is commonly referred to as “Fork Trucks.” Some of the more common types of fork trucks we see on the jobsite include:

- Rear Steer Counter Balanced Fork Trucks that can be ridden upon.
- Rough Terrain Four Wheel Drive Fork Trucks
- Cantilevered Fork Trucks (Lulls and Square shooters)

The following outline is intended as a review for those persons who have attended and successfully completed a certified fork lift / lull training program either for field work or in a garage/ warehouse environment.

The purpose of the training program is to ensure that the operator has sufficient information to allow him or her to operate the fork truck in a manner that will not endanger the operator, his or her co-workers and will not cause any damage to materials or the surroundings.

All training records must be verified and copies sent to Chris Giamo at 5500 Bingham St.

Person having received training elsewhere must be evaluated by the J. J. white Inc. Safety Coordinator before operating any fork trucks.

Safety Rules Review Outline

Drive Smart, Drive Safe and Drive with Skill

The reason for fork truck training is not to teach individuals how to drive. Virtually everyone has a driver's license and understands the basics of driving a vehicle. What most people do not understand are the basic and profound differences between a fork truck and the family sedan.

1. **Fork Truck Basics – Know your truck and auxiliary equipment.**

- Operators must be trained, qualified, and authorized.
- Using the pre-shift inspection sheet (found at the back of this program perform a pre-shift safety inspection and report any damaged or faulty equipment to your immediate supervisor. Do not operate the fork truck until the faulty equipment has been repaired.
- Use auxiliary equipment (such as drum handlers or hydraulic attachments) only as it was designed and intended for.

2. **Know your loads and carry them properly.**

- Read and understand the capacity plate on your fork truck.
- Know the weight of the loads you intend to lift and stay within the rated capacity of your truck.
- Center the weight of the load between the forks.
- Watch the “swing” when handling long loads such as pipe or structural steel members.
- Always keep the load facing up on ramps of 10% or more, regardless of whether you are ascending or descending the ramp.
- Travel with the lifting mechanism tilted slightly back and raised only enough to clear ground obstacles.

3. **Know your operating area.**

- Know critical clearance areas and the location of pipes, electrical conduit and wiring, door openings and door jamb widths and heights.
- **Never** turn or angle your fork truck across a ramp or incline. **Loaded or unloaded, it can turnover!** Wait until you reach either the top or bottom of the ramp before you change direction.
- **Never** fill the fuel tank, change propane fuel tanks or charge the battery when there are hot work activities taking place in the immediate area.

4. Protect yourself and others.

- **No Riders!** When lifting personnel use only an A.N.S.I. approved safety platform that firmly attaches to the forks and carriage. Personnel are **never** to be lifted on the forks or a pallet.
- Keep arms, legs and head inside the confines of the fork truck.
- Allow no one under the forks or a load. Keep yourself and others clear of the hoisting mechanism.
- When leaving the fork truck always lower the forks completely, set the parking brake and turn off the engine.

5. If you can't see (of haven't looked), don't go!

- If forward visibility is obstructed, travel in reverse.
- Sound your horn at corners, cross aisles and other areas where visibility is restricted.
- Always look in the direction of travel. Do not start moving without first looking where you're going.
- Be aware of co-workers' positioning in relation to the fork truck. Don't move until you are sure of their position.

6. Use common sense

- **Slow Down!** There is nothing so important here at J. J. White Inc. that you need to speed around the yard or jobsite with a fork truck, endangering yourself and others. Anyone caught operating in a careless or negligent manner will be subject to the J. J. White Inc. Disciplinary Policy.
- Allow at least 3 (three) truck lengths between you and other moving equipment and cars.
- Avoid holes, slick spots and loose material that may cause your truck to swerve or dip.

7. Protect yourself, fasten your seat belt!

- **Failure to follow these instructions can cause the fork truck to tip over!**
- **If the truck tips over, do not jump! Hold firmly to the steering wheel, brace your feet, lean forward and away from the point of impact!**

A Trained Operator is the Greatest Safety Available!

8. Comparison of Fork Trucks to Automobiles.

| <u>Fork Truck</u> | <u>Automobile</u> |
|---|---|
| Rear Wheel Steering | Front Wheel Steering |
| Brakes on front two (2) wheels only | Brakes on all four (4) wheels |
| No spring suspension system | Four (4) wheel spring suspension system |
| Points of support = three (3) | Points of support = four (4) |
| Weight unloaded = six (6) tons* | Weight unloaded = two (2) tons |
| Weight loaded = ten (10) tons* *Depending on size and capacity of fork truck | Weight loaded = two and a half (2 ½) tons |
| Safer when loaded (unloaded fork trucks are disproportionately heavy at the rear due to counterweights) | Safer when unloaded (Automobile weight is generally distributed evenly between the front and rear wheels) |
| Rear of vehicle swings out when turning | Front of vehicle turns first |

9. Points to Ponder

- **Truism** – An unloaded fork truck is more hazardous than a loaded fork truck. Why?

Reason #1- The natural tendency is to pay closer attention when the fork truck is loaded.

However, close attention should also be paid when the truck is empty due to its disproportionate weight distribution (i.e., counterweights over the steering wheels).

Reason #2 – Because counterweights are over the steering wheels, those weights are given added momentum during turns. Fast, sharp turns, in particular, will contribute to the overturn of the fork truck.

- **Fact** – A fork truck traveling downhill with its forks facing uphill will take up to four times longer to stop than a fork truck traveling with its forks facing downhill. Why?

Reason #1- Fork trucks only have brakes on two of its wheels, the drive wheels. The steering wheel(s) have no brakes.

Reason #2 – The truck traveling downhill with its counterweights facing downhill and its forks facing uphill have the counterweight center of gravity moved away from the braking wheels. Therefore stopping distances increase. Conversely, the fork truck traveling with its forks downhill (unloaded of course!) and counterweights uphill have moved the counterweight center of gravity closer to the braking wheels and stopping distances are increased.

Remember loaded fork trucks always travel with their forks pointing uphill, regardless of whether they are ascending or descending the ramp.

DAILY MOBILE EQUIPMENT INSPECTION FORM INCLUDING MOTOR VEHICLES

Use (✓) to indicate equipment is in satisfactory or unsatisfactory condition (N/A if not applicable). All unsatisfactory require comment below. All critical malfunctions must be reported *immediately* to Equipment Manager (215) 416 – 3992.

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----|---|-----|------|---|-----|-----|---|-----|-----------------------|---|-----|-----------------------|---|-----|-----|---|-----|-----|---|-----|--|--|--|--|
| DATE: | | | | | | | | | | | | | LOCATION: | | | | | | | | | | | | |
| EQUIPMENT #: | | | | | | | | | | | | | CAPACITY: | | | | | | | | | | | | |
| MAKE: | | | | | | | | | | | | | IF FUELED, # GALLONS: | | | | | | | | | | | | |
| MODEL: | | | | | | | | | | | | | DIESEL OR GASOLINE: | | | | | | | | | | | | |
| CHECK LIST: | MON | | | TUES | | | WED | | | THURS | | | FRI | | | SAT | | | SUN | | | | | | |
| MILEAGE/HOURS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| | S | U | N/A | S | U | N/A | S | U | N/A | S | U | N/A | S | U | N/A | S | U | N/A | S | U | N/A | | | | |
| ALL FLUIDS/OIL: | | | | | | | | | | | | | | | | | | | | | | | | | |
| BATTERY/HOLD DOWNS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| HOSES/BELTS/TUBING: | | | | | | | | | | | | | | | | | | | | | | | | | |
| LEAKS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| GAUGES/ WARNING LIGHTS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| HORN: | | | | | | | | | | | | | | | | | | | | | | | | | |
| WIPERS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| BRAKES: | | | | | | | | | | | | | | | | | | | | | | | | | |
| BACKUP ALARM: | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALL FUNCTIONS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| TIRES/TRACKS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| EXHAUST: | | | | | | | | | | | | | | | | | | | | | | | | | |
| LADDERS/STEPS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| MIRRORS/GLASS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| SEATBELT: | | | | | | | | | | | | | | | | | | | | | | | | | |
| FIRE EXTINGUISHER: | | | | | | | | | | | | | | | | | | | | | | | | | |
| LABELS/PLACARDS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| STRUCTURAL/FRAME: | | | | | | | | | | | | | | | | | | | | | | | | | |
| OPERATION MANUAL: | | | | | | | | | | | | | | | | | | | | | | | | | |
| RETAINERS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| CYLINDER/LINKAGE: | | | | | | | | | | | | | | | | | | | | | | | | | |
| STEERING: | | | | | | | | | | | | | | | | | | | | | | | | | |
| ENGINE COMPARTMENT: | | | | | | | | | | | | | | | | | | | | | | | | | |
| CARGO COVER: | | | | | | | | | | | | | | | | | | | | | | | | | |
| HITCH: | | | | | | | | | | | | | | | | | | | | | | | | | |
| LOAD BACKREST EXTENSION: | | | | | | | | | | | | | | | | | | | | | | | | | |
| OVERHEAD GUARD: | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASSIST GRIP: | | | | | | | | | | | | | | | | | | | | | | | | | |
| ACCELERATOR: | | | | | | | | | | | | | | | | | | | | | | | | | |
| INCHING PEDAL: | | | | | | | | | | | | | | | | | | | | | | | | | |
| PARKING BRAKE LEVER: | | | | | | | | | | | | | | | | | | | | | | | | | |
| SERVICE BRAKES: | | | | | | | | | | | | | | | | | | | | | | | | | |
| SEAT ADJUSTMENT: | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAST AND FORKS/ INTERLOCK SYSTEM: | | | | | | | | | | | | | | | | | | | | | | | | | |
| LOAD CHART: | | | | | | | | | | | | | | | | | | | | | | | | | |
| OUTRIGGERS & MATS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| BOOM IN/OUT/UP/DOWN: | | | | | | | | | | | | | | | | | | | | | | | | | |
| BOOM INDICATORS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAIN BOOM/JIB EXTENSION: | | | | | | | | | | | | | | | | | | | | | | | | | |
| WINCH: | | | | | | | | | | | | | | | | | | | | | | | | | |
| SWING: | | | | | | | | | | | | | | | | | | | | | | | | | |
| ANTI-TWO BLOCK: | | | | | | | | | | | | | | | | | | | | | | | | | |
| LMI/COMPUTER SYSTEM: | | | | | | | | | | | | | | | | | | | | | | | | | |
| LOAD BLOCK/BALL/HOOKS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| SAFETY LATCH: | | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEAVES: | | | | | | | | | | | | | | | | | | | | | | | | | |
| LIFT CYLINDER: | | | | | | | | | | | | | | | | | | | | | | | | | |
| WIRE ROPE/CABLE: | | | | | | | | | | | | | | | | | | | | | | | | | |
| CONTROLS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| This is to certify that I have inspected this piece of equipment and it is in satisfactory condition. | | | | | | | | | | | | | | | | | | | | | | | | | |
| OPERATOR'S NAME: | | | | | | | | | | OPERATOR'S SIGNATURE: | | | | | | | | | | | | | | | |
| COMMENTS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
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Forward this original form to the Equipment Manager each week.

This is not a substitute for the DOT Log Book

If Aerial Work Platform/ High Reach, Daily Inspection Form is the High Hazard JSA Form.

APPENDIX 19

INFECTION CONTROL PLAN FOR HOSPITAL CONSTRUCTION AND RENOVATION



J. J. White, Inc.

Infection Control Plan for Hospital Construction and Renovation

I. General

It is the intent of J. J. White, Inc. to provide both a workplace free from the harmful effects of infectious disease and to provide support to our health care customers' existing Infection Control program while performing construction activities. This will be accomplished to the extent possible by using accepted, feasible engineering controls. If such controls are not feasible, work practice controls will be utilized to minimize the possibility of an infectious disease occurrence.

II. Purpose

The requirements of this procedure are to establish the criteria deemed necessary to ensure the effective management and implementation of an Infectious Control program for J. J. White, Inc. to be utilized during hospital construction activities.

III. Scope

The requirements of this procedure are applicable to all J. J. White, Inc. employees, visitors, and or sub-contractor personnel performing work activities within a healthcare facility.

Note: This program does not relieve any sub-contractor of their responsibility to ensure the safety of their employees, nor does it relieve them of their responsibility to ensure compliance with all applicable governmental laws and regulations.

IV. Definitions

- A. Centers for Disease Control and Prevention (CDC) – The lead federal agency for protecting the health and safety of the people of the United States – at home and abroad, providing credible information to enhance health decisions, and promoting health through strong partnerships.
- B. High Efficiency Particulate Air (HEPA) Filter – A filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter.

- C. Infection Control Risk Assessment (ICRA) – Documentation required during Construction or Renovation projects. It can appear in the form of tools or matrices that classify construction projects by type and activities; give descriptions of required infection control precautions by class, both during construction and upon project completion; and provide paper forms that ask for the signatures of contractors and subcontractors as a way of building project awareness. The form/ process is used to identify the areas where the risk of waterborne and airborne infection is the greatest.
- D. Interim Life Safety Measures (ILSM's) – Measures designed to compensate temporarily for the hazards posed by existing Life Safety Code deficiencies or construction activities.
- E. Invasive Procedure – A medical procedure in which the body is “invaded” or entered by a needle, tube, device, or scope.
- F. Joint Commission on Accreditation of Healthcare Organizations (JCAHO)– A quality oversight body for health care organizations and managed care in the United States.
- G. National Institute for Occupational Safety and Health (NIOSH) - The federal agency responsible for conducting research and making recommendations for the prevention of work-related disease and injury. The Institute is part of the Centers for Disease Control and Prevention (CDC).
- H. Personal Protective Equipment (PPE) – Equipment designed for a specific task to prevent an injury and/or increase the comfort level of an employee while performing work related activities.

V. **Responsibilities**

A. **Employer**

Provide to every extent possible a workplace free of hazards and disease. Whenever possible, this will be accomplished through the use of engineering and administrative controls. At any time that engineering and administrative controls are not feasible, then J. J. White, Inc., will provide its employees with personal protective equipment (PPE) to safely and effectively perform the specific job task.

- Additionally, J. J. White, Inc., will provide all necessary and required training to its employees and sub-contractor employees. Training must include, but will not be limited to the following:
 - Infection Control Plan for Hospital Construction
 - PPE
 - Respiratory Protection
 - Lockout/Tagout
 - Hazard Communication

B. Employee

1. Will obey all J. J. White, Inc., as well as, any facility Policies and Procedures that apply while work is being performed within a healthcare facility.
2. Report to his or her supervisor any problems or concerns as they may apply to this, or any other J. J. White, Inc., Safety and Health Procedure.

C. Safety Department

1. Facilitate training to supervisors and employees on the requirements set forth within this procedure.
2. Supply field personnel with the necessary support to effectively fulfill all of the requirements of this, as well as any other policy.
3. Review the requirements set forth by a healthcare facility to ensure that J. J. White, Inc. complies with all applicable policies.
4. Review the scope of work as required to identify any potential health risks that may impact employees. These potential health risks include:
 - a. Asbestos
 - b. Lead
 - c. Polychlorinated Biphenyls (PCB's)
 - d. Waterborne Diseases
 - e. Airborne Diseases
 - f. Bloodborne Pathogens
5. Periodically audit and review this procedure to ensure that the intent of the procedure is being met as well as its effectiveness.

VI. Program Requirements

A. Introduction

One of the major obstacles affecting the demolition, renovation and construction in healthcare facilities, including but not limited to, hospitals, clinics and nursing homes, is the control of, or the spread of, infectious diseases. Infectious diseases during construction activities can be generated and affect people in different ways.

In order to effectively and safely complete a construction activity in a healthcare facility, complete coordination and communication among all parties involved must occur. This communication involves not only J. J. White, Inc. personnel and subcontractor personnel, but also the healthcare organization's facility maintenance or construction representative as well as the organization's Infection Control Officer or committee.

J. J. White, Inc., VP-HSE Joe Crowley, is assigned as the Infectious Control Officer (ICO). The ICO will administer and oversee the requirements of this program and assist in the successful completion of all projects.

A successful outcome for infection control in the planning and construction of healthcare buildings requires both formal and informal collaboration with all key parties during each phase of the project.

B. Infection Control Risk Assessment (ICRA)

The Owner, prior to J. J. White, Inc. arriving at the facility to perform any work activities, should complete an Infection Control Risk Assessment (ICRA). An ICRA sets the scene for involving infection control personnel and supports continuing implementation of infection control principles.

An ICRA can be accomplished in different ways depending on the owner's procedures and processes. A generic custom matrix type document is just one example that facilities will use to meet their requirements. J. J. White, Inc. personnel should review this document during the planning stages of any healthcare related project. This document will provide vital information on the required precautions that will need to be taken including, but not limited to, isolation, work schedules and ventilation.

Please see Appendix A for an example of a generic ICRA matrix.

C. Project Phases

1. Planning – Design and Approval

In order for an infection control program to be implemented properly and completely in a project, it is essential that the infection control staff participate in the design and approval stages. This will set the tone for infection control during the project.

Issues that may be addressed include, but are not limited to:

- a. Budget
- b. Equipment storage and cleaning areas
- c. Air handling units
- d. Specific construction related products with infectious implications

Note: When choosing wall finishes, materials that are free of fissures, open joints, or crevices that may retain or permit the passage of dirt particles, must be avoided.
- e. Any and all applicable regulations
- f. Any emergencies that may be encountered during the life of the project must be considered and planned for. This type of planning should involve the J. J. White, Inc. Safety Department as well as representatives from the healthcare facility. Items to be addressed include:
 - i. General Emergencies

Note: As discussed later in Section VI.C.4.a.v., routes of travel through a healthcare facility are an important consideration with regards to Isolation & Control. With this in mind, predetermined Emergency Evacuation Routes, both Primary & Secondary, must be determined, and communicated to all personnel.
 - ii. Utility Interruptions
 - iii. Environmental Emergencies

2. Area Preparation

Preparation of the construction/ renovation area prior to the start of the physical work is another key element of this infectious control program. The focus at this stage must be the isolation of the area from the remaining portion of the healthcare facility. Based on the information identified in the ICRA, the extent and level of precautionary systems that must be put in place will vary.

a. Isolation & Control

- Medical waste containers for sharps and medical regulated waste must be removed by the facility prior to J. J. White, Inc. performing any work. Neither J. J. White, Inc., nor any of its subcontractors may handle or remove any medical waste materials or containers.
- A barrier system must be utilized in every renovation or construction activity. But as stated above, the sophistication of the barrier depends on the risk of infection and the extent of construction activities. The barrier could be as simple as fire-rated plastic that extends from floor to ceiling for smaller projects. Any project that produces moderate to high levels of dust requires rigid, dust-proof, and fire-rated barrier walls with caulked seams for a tight seal. Please consult with the J. J. White Safety Department for specific barrier requirements.

3. Material Storage

No building under construction or being renovated is immune to hazardous conditions, including construction generated air pollution. This is why a risk assessment is important for all projects. The creation of fungi from water-damaged building materials may result in the owner not accepting a building. Often, buildings are water-damaged because the gypsum board is not stored in a weather-protected area, or it is installed flush with the poured slab, enabling water to absorb into the bottom of the gypsum board.

Water damage and subsequent mold growth should be prohibited as part of building specifications. Tools are available to detect moisture in walls, ceilings, and other porous materials, and should be used if there is any possibility that moisture may be present in the building material. The fact that mold is present in air and soil must be factored into the assessment of water damage.

To reduce the possibility of water damage caused by improperly stored material, all materials must be stored in a location that is protected from the elements. This may be accomplished by the use of a storage trailer or storing the material inside where the construction activity is taking place. The location should be one that provides the protection from moisture that is required and is convenient to both the work being performed and the operation of the healthcare facility.

4. Demolition & Construction

a. Isolation & Control

- i. The construction or renovation area must be isolated as completely as physically possible, with minimal impact to the operation of the healthcare facility as well as life safety issues. The number of entry/ exit ways shall be kept to a minimum.
- ii. An entry and exit procedure for the construction area must be defined in conjunction with the facility owner. Designated paths of travel must be kept free of debris, equipment and materials at all times.
- iii. Only authorized personnel with the proper PPE for the work being performed will be permitted into the affected area. Signage shall be posted outside of the area to direct unauthorized individuals away from the area.
- iv. If possible, prior to the start of any work activities, the healthcare facility should notify all employees of the upcoming work activities. This can be accomplished through a company newsletter and/or bulletin board postings.
- v. Routes of travel for personnel and material through the facility, if direct access to the outside is not present, must be designated by the facility. This will reduce the possibility of contamination in other areas of the facility as well as provide greater facility control.

b. Dust & Debris Containment

- i. Dust and debris generated during demolition and construction activities must be contained to every extent possible, within the construction area. This is accomplished through a number of practices including proper ventilation practices (see section VI.C.4.c.), and housekeeping techniques.
- ii. Debris shall be removed from the site daily to keep the accumulation to a minimum.
 - If the debris will be transported through a facility, only designated traffic routes shall be used and the containers must have tightly fitting covers.
 - If a trash chute is used to transport the debris outside, a HEPA filtered negative air machine must be used and the chute opening should be sealed when not in use.
- iii. When performing exterior activities, the same emphasis must be placed on dust and debris control as interior activities. To achieve this objective, all windows and doors in the immediate construction area shall be taped or sealed to minimize the possibility of infiltration of contaminated air or dust that has been generated.

Note: Doors that serve as emergency exits must not be sealed so as to prevent exit during an emergency. Additionally, any sealed doors or windows should be properly labeled so as to prevent their inadvertent opening.
- iv. Worksite Clothing
 - Work clothing, depending on the type chosen, will require different levels of care to control the spread of dust and contamination.
 - If basic contractor “work clothes” are worn, they should be free of loose dust and debris prior to leaving the construction area. This can be achieved via the use of a HEPA-filtered vacuum.

- When PPE, such as Tyvek suits, is worn it should be removed just prior to exiting the construction area. Removal of the PPE immediately before exiting the area will prevent the accumulation of dust onto the individual's clothes and thus reduce the possibility of the spread of contamination.
- Anytime an employee must enter an area that performs invasive procedures, they must be provided with disposable Tyvek suits and head and shoe coverings.
- Additionally, the use of a commercially available "Walk-off Mat" may be placed at entrances/ exits to the construction area. These "mats" help to reduce the tracking of debris to patient areas.

v. Daily Cleaning

- Tools and equipment being brought into the work area must be wiped down with a damp towel or cloth, prior to exiting the work area.
- As mentioned previously, and with all jobs, housekeeping is of utmost importance. The construction area must be swept or HEPA-vacuumed (if necessary) at a minimum of once a day. This may need to be accomplished more often per day, depending on the level of work being performed.
- Areas adjacent to the construction areas may need to be mopped on a daily basis to collect any dust. The project superintendent, in communication with the facility representative, shall make this determination.

Note: An agreement must be made with the facility prior to the start of work to determine if J.J.White, Inc., personnel will perform this function or if the facility environmental services department will handle the task.

c. Ventilation & Indoor Air Quality

- i. The use of proper ventilation practices is important in maintaining the proper indoor air quality required in healthcare organizations. Typically, construction areas will be set up under a negative pressure, as compared with the remainder of the building, if the work is being performed within the facility. This will isolate the construction area from the remainder of the building in terms of violation.
- ii. The arrangement of a healthcare organization's ventilation system must not be altered without the input and approval of the organization's maintenance engineer or equivalent.
- iii. When dealing with critical adjacent areas, such as operating rooms, it is suggested that testing and balancing of the ventilation be performed prior to, and during construction activities. The completed ICRA, along with Appendix B – "Hospital Areas with Special Ventilation Requirements" will assist in identifying these areas of concern.
- iv. Indoor Air Quality (IAQ) is of paramount concern regarding infection control and ventilation. The "quality of air" is dependent upon numerous variables, including, but not limited to: air changes per minute, temperature, humidity, and rate of flow. Typically, these variables are controlled through the facilities heating, ventilation and air conditioning (HVAC) system. It may be necessary, depending on the work activities and the time of year, to adjust the system to control these variables.
- v. The HVAC systems Outdoor Air Intakes supply it with air. Caution must be used to avoid having running equipment staged near an operable air intake. For this reason, outside excavation activities near air intakes shall be limited to when the intakes can be shut down. This will prevent the inadvertent intake of exhaust fumes.
- vi. The air exhausted from the construction area, if possible, shall be directed outside with no recirculation. If the exhausted air must be tied into a recirculated air system, a pre-filter and a HEPA filter shall be used before the exhaust to prevent contamination of the ventilation ducts.
- vii. Throughout the life of the project, any input from the facility's infection control specialist shall be taken into consideration and any necessary changes shall be made as soon as possible.

d. Environmental Control

- i. Typically during minor construction or renovation projects, environmental control is accomplished through visual inspection. These inspections shall be completed at least once daily, if not more frequently.
- ii. In major renovation situations where adjacent patient areas or units that cannot be closed are located, special planning is required. Environmental monitoring further than visual inspection to detect airborne contamination must be utilized in the above mentioned situation.
- iii. Regarding environmental sampling and control in general, the following quote shall be taken into account during the life of a project: “It is better to avoid the presence of fungi through good maintenance and construction practices than it is to rely on sampling to see if fungi are present.”¹

5. Clean-up & Preparation for Return

- a. Clean up must include the removal of all supplies, materials, debris and trash as necessary.
- b. The entire construction area must be mopped, or wiped down to properly decontaminate it. The decontamination material (bleach, Alconox, etc.) shall be chosen based on input from the healthcare facility management. Any material used must have an SDS available on site for employees to review and for use in the event of an emergency.
- c. If a “punch list” is developed, all items shall be verified complete.

6. Final Review

Following the completion of all work and clean-up activities, a formal review with the facility representatives and the J. J. White, Inc., project supervision must be conducted. This review will serve as a final inspection of all completed work.

¹ Streifel, MPH, REHS, Andrew J., “Health-Care IAQ: Guidance for Infection Control”, HPAC Heating/Piping/Air Condition Engineering, October 2000, pg 3;

VII. Training and Information

- A. All Supervisors and Employees, who will be required to perform construction activities within a healthcare facility, will receive training on the requirements set forth within this procedure prior to their initial assignment.
- B. Retraining will be administered annually and when the following conditions occur:
 - 1. Inadequacies in the employee's knowledge of this procedure indicate that the employee has not retained the requisite understanding.
 - 2. Changes in the workplace render the previous training obsolete; or
 - 3. Any other situation that arises in which retraining appears necessary to ensure the safety of all employees.

VIII. Program Evaluation

- A. The Safety Department will periodically review the elements of the procedure to verify that the intent of the procedure is being met as well as its effectiveness.
- B. Daily audits must be conducted by the Job Superintendent, General Foreman, or Site Safety Coordinator (if applicable), to ensure that the requirements of this procedure are being followed.

IX. Recordkeeping

- A. The Safety Department will maintain all records as they pertain to this program.
- B. Job Superintendents or General Foreman, should forward all completed daily audits to the Safety Department for retention.

X. References

- A. American Society for Healthcare Engineering (ASHE), *Infection Control Risk Assessment, Matrix of Precautions for Construction Activities*;
- B. American Institute of Architects, *Guidelines for Design and Construction of Hospital and Health Care Facilities 2001*, Washington, D.C., AIA Academy of Architecture for health with assistance from the USDHHS, AIA Press;
- C. Bartley, MD, MPH, CIC, Judene Mueller, "APIC State-of-the-Art Report: The role of infection control during construction in healthcare facilities", *The 1997, 1998, and 1999 APIC Guidelines Committees*;

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- D. Hendrickson, RN, CIC, Christine and Andrew J. Streifel, MPH, REHS, “Assessment of Health Risks Related to Construction”, *HPAC Heating/Piping/Air Conditioning Engineering*, February 2002;
- E. Streifel, MPH, REHS, Andrew J., “Health-Care IAQ: Guidance for Infection Control”, *HPAC Heating/Piping/Air Conditioning Engineering*, October 2000, pg 28-36;
- F. “The New AIA Guidelines ‘Construction and Renovation: New Challenges for Infection Control”, *Infection Control Today*, 10/2001.

XI. **Appendices**

- A. Infection Control Risk Assessment, Matrix of Precautions for Construction Activities
- B. Hospital Areas with Special Ventilation Requirements

Appendix A



J. J. White, Inc.

Infection Control Risk Assessment Matrix of Precautions for Construction & Renovation

Step One:

Using the following table, *identify* the Type of Construction Project Activity (Type A-D)

| | |
|---------------|---|
| Type A | Inspection and Non-Invasive Activities Includes, but is not limited to: <ul style="list-style-type: none">• Removal of ceiling tiles for visual inspection limited to 1 tile per 50 square feet• Painting (but not sanding)• Wall covering, electrical trim work, minor plumbing, and activities, which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection. |
| Type B | Small scale, short duration activities which create minimal dust Includes, but is not limited to: <ul style="list-style-type: none">• Installation of telephone and computer cabling• Access to chase spaces• Cutting of walls or ceiling where dust migration can be controlled. |
| Type C | Work that generates a moderate to high level of dust or requires demolition or removal or any fixed building components or assemblies Includes, but is not limited to: <ul style="list-style-type: none">• Sanding of walls for painting or wall covering• Removal of floor coverings, ceiling tiles, and casework• New wall construction• Minor duct work or electrical work above ceilings• Major cabling activities• Any activity, which cannot be completed within a single work shift |
| Type D | Major demolition and construction projects Includes, but is not limited to: <ul style="list-style-type: none">• Activities which require consecutive work shifts• Requires heavy demolition or removal of a complete cabling system• New construction |

Step 1: _____

Step Two:

Using the following table, identify the Patient Risk Groups that will be affected. If more than one risk group will be affected, select the higher risk group:

| Low Risk | Medium Risk | High Risk | Highest Risk |
|--|---|--|---|
| <ul style="list-style-type: none"> Office Areas | <ul style="list-style-type: none"> Cardiology Echocardiography Endoscopy Nuclear Medicine Physical Therapy Radiology/MRI Respiratory Therapy | <ul style="list-style-type: none"> CCU Emergency Room Labor & Delivery Laboratories (specimen) Newborn Nursery Outpatient Surgery Pediatrics Pharmacy Post Anesthesia Care Unit Surgical Units | <ul style="list-style-type: none"> Any area caring for immunocompromised patients Burn Unit Cardiac Cath Lab Central Sterile Supply Intensive Care Units Medical Unit Negative pressure isolation rooms Oncology Operating rooms including C-section rooms |

Step 2: _____

Step Three: Match the

Patient Risk Group (*Low, Medium, High, Highest*) with the planned...
Construction Project Type (*A, B, C, D*) on the following matrix, to find the...
Class of Precautions (*I,II,III,IV*) or level of infection control activities required.

Class I-IV or Color-Coded Precautions are delineated on the follow page.

IC Matrix- Class of Precautions: Construction Project by Patient Risk
Construction Project Type

| Patient Risk Group | Type A | Type B | Type C | Type D |
|--------------------|--------|--------|--------|--------|
| LOW Risk Group | I | II | II | III/IV |
| MEDIUM Risk Group | I | II | III | IV |
| HIGH Risk Group | I | II | III/IV | IV |
| HIGHEST Risk Group | II | III/IV | III/IV | IV |

Note: Infection Control approval will be required when the Construction Activity and Risk Level indicates that **Class III** or **Class IV** procedures are necessary.

Step 3: _____

Description of Required Infection Control Precautions by Class
During Construction Project **Upon Completion of Project**

| | | |
|------------------|---|---|
| Class I | <ol style="list-style-type: none"> 1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace a ceiling tile displaced for visual inspection. | |
| Class II | <ol style="list-style-type: none"> 1. Provide active means to prevent airborne dust from dispersing into atmosphere. 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Place dust mat at entrance and exit of work area. 6. Remove or isolate HVAC system in areas where work is being performed. | <ol style="list-style-type: none"> 1. Wipe work surfaces with disinfectant. 2. Contain construction waste before transport in tightly covered containers. 3. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 4. Remove isolation of HVAC system in areas where work is being performed. |
| Class III | <ol style="list-style-type: none"> 1. Remove or isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with EA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Contain construction waste before transport in tightly covered containers. 5. Cover transport receptacles or carts. Tape coverings unless solid lid. | <ol style="list-style-type: none"> 1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department. 2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 3. Vacuum work area with HEPA filtered vacuums. 4. Wet mop area with disinfectant. 5. Remove isolation of HVAC system in areas where work is being performed. |
| Class IV | <ol style="list-style-type: none"> 1. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work areas or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Seal holes, pipes, conduits, and punctures appropriately. 5. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or the can wear cloth or paper coveralls that are removed each time they leave the work site. 6. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area. 7. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department. | <ol style="list-style-type: none"> 1. Remove barrier material carefully to minimize spreading of dirt and debris associated with construction. 2. Contain construction waste before transport on tightly covered containers. 3. Cover transport receptacles or carts. Tape covering unless solid lid. 4. Vacuum work area with HEPA filtered vacuums. 5. Wet mop area with disinfectant. 6. Remove isolation of HVAC system in area where work is being performed. |

Step 4: Identify the areas surrounding the project area, assessing potential impact

| Unit Below | Unit Above | Lateral | Lateral | Behind | Front |
|------------|------------|------------|------------|------------|------------|
| | | | | | |
| Risk Group | Risk Group | Risk Group | Risk Group | Risk Group | Risk Group |

Step 5. Identify specific site of activity Ex. patient rooms, medication room, etc.

Step 6. Identify issues related to: ventilation, plumbing, electrical in terms of the occurrence of probable outages.

Step 7. Identify containment measures, using prior assessment. What types of barriers? (Ex. solids wall barriers); Will HEPA filtration be required?

(Note: Renovation/construction area shall be isolated from the occupied areas during construction and shall be negative with respect to surrounding areas)

Step 8. Consider potential risk of water damage. Is there a risk due to compromising structural integrity? (Ex. Wall, ceiling, roof)

Step 9. Work hours: Can or will the work be done during non-patient care hours?

Step 10. Do plans allow for adequate number of isolation/negative airflow rooms?

Step 11. Do the plans allow for the required number & type of hand washing sinks?

Step 12. Does the infection control staff agree with the minimum number of sinks for this project? (Verify against AIA Guidelines for types and area)

Step 13. Does the infection control staff agree with the plans relative to clean and soiled utility rooms?

**Step 14. Plan to discuss the following containment issues with the project team.
Ex. Traffic flow, housekeeping, debris removal (how and when)**

Appendix: *Identify and communicate the responsibility for project monitoring that includes infection control concerns and risks. The ICRA may be modified throughout the project. Revisions must be communicated to the Project Manager.*

Appendix B



J. J. White, Inc.

Hospital Areas with Special Ventilation Requirements

| AT-RISK AREA | EQUIPMENT | PLANNING | ROUTINE EVALUATION |
|------------------------------|---|---|---|
| Bone-marrow transplant | Air handling system: <ul style="list-style-type: none">• Filtration• Air exchanges• Positive pressure• Emergency power• Redundant equipment | <ul style="list-style-type: none">• Preventive maintenance• Air-quality• Emergency planning• Training• Outage notification• Bearings | <ul style="list-style-type: none">• Air changes per hr• Pressure differential• Filtration analysis• Vibration check• Fan belts |
| Operating room | Air handling system: <ul style="list-style-type: none">• Filtration• Air exchanges• Positive pressure• Emergency power | <ul style="list-style-type: none">• Preventive maintenance• Air-quality certification• Emergency planning• Training• Outage notification | <ul style="list-style-type: none">• Air changes per hr• Pressure differential• Filtration analysis• Vibration check• Fan belts• Bearings |
| Airborne-infection isolation | Air handling system: <ul style="list-style-type: none">• Negative pressure• Emergency power• Exhaust systems | <ul style="list-style-type: none">• Preventive maintenance• Outage notification• Training• Label fan | <ul style="list-style-type: none">• Air changes per hr• Pressure differential• Fan belts |
| Local exhaust areas | Local vacuum system: <ul style="list-style-type: none">• Filters• Hose attachments• Air-flow velocity | <ul style="list-style-type: none">• Training of operators• Preventive maintenance• Outage notification• Label fan | <ul style="list-style-type: none">• Filter changes• Air velocity and/or room-air changes |

APPENDIX 20

COMMERCIAL FLEET POLICY/LEASE VEHICLE POLICY



**J. J. White, Inc.
Fleet Safety Program**

1.0 PURPOSE

The purpose of this policy is to promote the safe operation of company-owned or rented vehicles, as well as employees' personal vehicles (when participating in the rental reimbursement program) and, in the process reduce the company's exposure to financial loss resulting from vehicle accidents or incidents (either personal injury or damage to company equipment) and promote a positive public image. We have established procedures for pre-qualifying drivers, training/orientation, vehicle inspection, preventative maintenance, accident/incident reporting as well as accident/incident investigation.

2.0 SCOPE

This program applies to all drivers of company-owned/rented vehicles at all times, as well as drivers in the rental reimbursement program, while operating their vehicle in the furtherance of the company's interests.

3.0 DRIVER QUALIFICATIONS & PROCEDURES

In order to be eligible to drive a company-owned/rented vehicle, an employee (or potential employee) must first meet the following minimal requirements:

- o Non-CDL Requirements
 - Drivers must possess a valid motor vehicle operator's license, issued in the United States, and be at least 18 years of age.
 - Drivers must complete the Safety Serve, Inc. online Review Test to display knowledge of laws and practices of operating vehicles safely.
- o CDL Requirements (coordinate with J.J. White Inc. Equipment Maintenance Supervisor)
 - Drivers must possess a valid CDL motor vehicle operator's license, issued in the United States, and be at least 21 years of age.
 - Drivers must complete the Safety Serve, Inc. online Review Test to display knowledge of laws and practices of operating vehicles safely.

Fleet Safety Program – J.J. White, Inc.

- Drivers must comply with all applicable Federal and State DOT Requirements including, but not limited to, Drug and Alcohol examination, medical review and road test.

Once the above requirements have been met, the candidate will complete the Motor Vehicle Record Release Form found at the end of this document and return it to the Safety Services Administration Manager along with a photocopy of his/her current driver's license. Motor Vehicle Records (MVRs) will be examined for the most recent three year period. The grading system will consist of points, assigned according to the schedule below, which will determine the employee's driving status. An accumulation of two or more points will result in disciplinary action, probation, possible loss of driving privileges and/or being reassigned to a non-driving position and/or possible termination of, or non-consideration for, employment with the company.

The following classification system will be used to determine eligibility to operate a Company vehicle:

- Acceptable- (0-1.9 points) may drive assigned vehicle.
- Probation- (2.0-3.0 points) may drive assigned vehicle only after review of the employee's driving record by the Sr. VP of Operations and the Safety Services Administration Manager. Employee may be subject to additional disciplinary action as outlined in the company Safety Awareness Manual.
- Unacceptable- (more than 3 points) the applicant is not hired. If already an employee, he/she is not permitted to drive under any circumstances, and may have company vehicle privileges permanently revoked. Further, employee may be reassigned to a non-driving position and/or subject to additional disciplinary action as outlined in the company Safety Awareness Manual up to and including termination of employment.

Points will be assigned as follows:

- **All Type A Violations** (4 points per violation and/or incident)
- **All Type B Violations** (2 points per violation and/or incident)
- **All Type C Violations** (1 point per violation and/or incident)

Points will be deducted at a rate of ½ of one point per 30 consecutive calendar day period during which a driver had no additional violations. However, any points assigned under this system as a result of a violation which also placed points on your actual state license, are only removed from the company system when the points from your state license have been removed.

Type A Violations:

- Any conviction or accident involving the use of a handheld device while driving.
- Any conviction for a felony while operating a motor vehicle
- Driving While Intoxicated or Driving While Under the Influence
- Operating a vehicle without a current, valid license
- Operating a motor vehicle without the owner's authority (grand theft)
- Permitting an unlicensed or unauthorized person to operate a vehicle
- Reckless driving or racing
- Hit and Run (with or without causing Bodily Injury or Property Damage).
- Failure to report any accident.
- Operation of a company vehicle not assigned to you without authorization.
- Any violation which causes the operator to lose his/her official driver's license.
- Any careless behavior which leads to the loss of a vehicle (e.g. leaving keys in car).

Type B Violations:

- All Moving Violations not listed as type A.
- Any "At Fault" accident not involving a Type A violation.

Type C Violations:

- Failure to take reasonable steps in the maintenance of a company vehicle including keeping inspection current, or loss of insurance card or manuals.
- Failure to take reasonable steps in the security of a company vehicle.
- Failure to properly park a company vehicle. A properly parked vehicle is one that is completely stopped and parked where it is legal, and prudent to park such a vehicle, or to stop to load/unload property/materials.
- Any parking ticket incurred while the company vehicle was in your care, custody and control.
- Any points on your state license (found during the initial MVR evaluation) whether or not related to, or incurred during, the operation of a company vehicle, will be treated as a Type C violation at a rate of 1 point in this system for every 2 points on your State license (any fractional points on your State license will be rounded down to the closest multiple of 2). Points will only be deducted from the company point system once they are removed from your actual State license.

Once a driver is deemed accepted into the program and provided a company vehicle, he/she will then be entered into the SAMBA database, which, in coordination with the states of Pennsylvania, Delaware, New Jersey & Maryland, will notify the company immediately of all traffic violations, or accidents involving the employee. This will ensure that we have the most current information on all drivers.

In the future, any information the Safety Services Administration Manager receives from SAMBA, will be immediately communicated to the Superintendent, and may result in disciplinary action (e.g. a warning, loss of driving privileges, etc.) up to and including possible termination of employment. This determination will be made by the Senior Vice President of Operations. If information garnered from a Motor Vehicle Record will be considered in an employment decision regarding an employee, (e.g. removing driving privileges, or termination of employment), the results of that MVR will be made available to the employee for their review, in accordance with the Fair Credit Reporting Act.

4.0 RESPONSIBILITIES

Project Superintendents are responsible for the maintenance and care of all company-owned/rented vehicles on their site which are not assigned to a specific individual, as well as the qualification of the drivers. Superintendents are responsible to ensure that ONLY licensed drivers with acceptable driving records operate company-owned/rented vehicles during the course and scope of their work (“company business”).

Project Superintendents, in coordination with the Equipment Maintenance Supervisor, will be responsible for maintaining a list of approved drivers for their project.

5.0 REQUIRED SAFE DRIVING PRACTICES

As the number of inexperienced and irresponsible drivers on public roads increases daily, it is incumbent upon all of us to adhere to a defensive driving policy. The following items represent the minimum acceptable behavior for operating company-owned/rented vehicles. All drivers of company-owned/rented vehicles are encouraged to operate their vehicles in the safest manner possible.

5.1 CARDINAL RULES

- ALWAYS FOCUS ON DRIVING THE VEHICLE ONLY. NEVER ATTEMPT TO MULTI-TASK WHILE OPERATING A VEHICLE.
- BEWARE OF BOTH UNSAFE AND OVERLY CAUTIOUS DRIVERS. BOTH TYPES CAN PLACE YOU IN POTENTIALLY DANGEROUS SITUATIONS.
- OBSERVE THOSE AROUND YOU AND ALWAYS BE PREPARED FOR SUDDEN CHANGES IN SPEED OR DIRECTION.
- NEVER USE ANY COMMUNICATION DEVICE IN OTHER THAN A HANDS-FREE MODE WHILE OPERATING A VEHICLE.

5.2 GENERAL DRIVING

- **Circle of Safety:** Before operating the vehicle at any time, but particularly when at a worksite and prior to reversing, the driver must walk around the vehicle to check for hidden objects/obstacles to be avoided when exiting the parking spot and to verify that the vehicle has not been damaged while unoccupied.
- **First Move Forward:** Drivers will safely back vehicles into parking spots whenever possible. This will afford the opportunity to pull forward as the first move, helping increase visual perspective and increase peripheral vision. Look for obstacles, low hanging wires, posts, poles, structures and even persons, other moving vehicles or vehicles likely to move.
- All occupants of company owned/rented vehicles must wear seat belts at all times within the vehicle.
- Drivers must yield the right of way at all traffic control signals and signs requiring them to do so. Drivers should also be prepared to yield for safety's sake at any time. Pedestrians and bicycles in the roadway always have the right of way.
- Drivers must honor posted speed limits. In adverse driving conditions, reduce speed to a safe operating speed that is consistent with the conditions of the road, weather, lighting, and volume of traffic. Tires can hydroplane on wet pavement at speeds as low as 10 MPH.
- Turn signals must be used to show where you are heading; while merging into traffic and before every turn or lane change.
- Be alert of other vehicles, pedestrians, and bicyclists when approaching intersections. Never speed through an intersection on a caution light. Approach a stale green light with your foot poised over the brake to reduce your reaction time should it be necessary to stop. When the traffic light turns green, look both ways for oncoming traffic before proceeding.
- Never back a vehicle when any mirror is covered with dirt, frost, snow or other substances that keep you from visually clearing the path the vehicle will take.
- When waiting to make left turns, keep your wheels facing straight ahead. If rear-ended, you will not be pushed into the lane of oncoming traffic.
- When stopping behind another vehicle, leave enough space so you can see the rear wheels of the car in front. This allows room to go around the vehicle if necessary, and may prevent you from being pushed into the car in front of you if you are rear-ended.
- Drivers are responsible for the security of company vehicles assigned to them. The vehicle engine must be shut off, ignition keys removed, and vehicle doors locked whenever the vehicle is left unattended. If the vehicle is left with a parking attendant, provide the attendant the ignition key only.
- Head lights shall be used during all of the following times: 1) ½ hour before sunset and ½ hour after sunrise, 2) at all times when the vehicle's windshield wipers are operating, and 3) at any time when a distance of 500 feet ahead of the vehicle cannot be seen clearly.
- All state and local laws and D.O.T. Motor Carrier Safety Regulations must be obeyed.

- If your company-owned/rented vehicle is equipped with a radio you are required to keep the volume at a suitable level in order to clearly hear sirens, emergency vehicles, trains, horns of other drivers, etc.
- Assume that other vehicles or individuals do not see you coming.

5.3 DRIVING ON INTERSTATE HIGHWAYS

- Always be prepared for the unexpected – it may save your life. When operating a vehicle on an interstate highway, be watchful for objects not fastened/loaded properly to the vehicle carrying them. Such objects can become lethal weapons when the vehicle hits a pothole. Conversely, always be sure that any items you are carrying in/on your vehicle are secured properly. Should an object come loose at any time during your trip, pull into the nearest safe parking area and re-secure the item(s).
- Always leave yourself an escape path, particularly in heavy traffic.
- Drivers are required to maintain a safe following distance at all times. On dry road surfaces, at a speed of 50 mph, the suggested distance (for passenger cars and pickups) between you and the vehicle in front of you is 175 feet. At that speed, you are traveling roughly 73 feet per second, therefore the time interval between you and the vehicle directly in front of you is a minimum of 3 seconds. On wet surfaces, that distance becomes 300 feet, or a time interval of 5 seconds. For heavy trucks, the intervals should be increased (depending upon the load) to at least 4 seconds on dry pavement and 7 seconds on wet surfaces.
- Drivers must honor posted speed limits. In adverse driving conditions, reduce speed to a safe operating speed that is consistent with the conditions of the road, weather, lighting, and volume of traffic. Tires can hydroplane on wet pavement at speeds as low as 10 MPH.
- Turn signals must be used to show where you are heading; while merging into traffic and before every turn or lane change.
- Avoid driving in other drivers' blind spots; attempt to maintain eye contact with the other driver, either directly or through mirrors.
- When passing or changing lanes, view the entire vehicle in your rear view mirror before pulling back into that lane.
- When stopping behind another vehicle, leave enough space so you can see the rear wheels of the car in front. This allows room to go around the vehicle if necessary, and may prevent you from being pushed into the car in front of you if you are rear-ended.

5.4 DRIVING WITHIN OWNERS' FACILITIES

- When operating a Company vehicle within the confines of an Owner's facility, all of the Owner's safety regulations are to be followed.
- Avoid operating a vehicle in reverse whenever possible. However, when it is necessary, keep the distance traveled to a minimum, always back to the driver's side of the vehicle and be particularly careful. Do not back around a corner or into an area of no visibility. Operators of heavy trucks should walk around their vehicle before backing and have someone guide you.

- Always be extremely alert of other vehicles, pedestrians, and bicyclists when driving within an owner's facility and always obey posted speed limits.
- All occupants of company owned/rented vehicles must wear seat belts at all times within the vehicle.

6.0 PROHIBITED PRACTICES

The following practices are prohibited in the operation of company-owned/rented vehicles:

- The use of a company vehicle while under the influence of intoxicants or drugs is forbidden and is cause for immediate termination of employment.
- No driver shall operate a company vehicle when his/her ability to do so safely has been impaired by illness, fatigue, injury, or prescription medication. Medical clearance from your physician evidencing your ability to drive will be required.
- Spouses and other family members are not authorized to drive company-owned/rented vehicles. Company vehicles are to be driven by authorized employees only, except in emergencies, or in case of repair testing by a mechanic.
- Unauthorized personnel (e.g. other Contractors & Hitch-hikers) are not allowed to ride in company vehicles.
- Using ANY communication device (i.e. cell phones, Nextel radios, walkie-talkies) in other than a hands-free mode while operating a Company vehicle is strictly prohibited. Operators are to pull into the nearest SAFE parking area to continue the communication; pulling off to the shoulder of the road is not acceptable.
- Vehicles are not to be used to haul materials or equipment, which are beyond the capacity of the vehicle.
- Smoking is strictly prohibited in company-owned/rented vehicles and will result in disciplinary action up to and including termination of driving privileges or even employment.

7.0 TOWING

- When towing equipment/trailers/etc. safety pins must be used to lock the hook in the closed position and safety chains must also be used.
- Towing of equipment not being used for company business is prohibited.

8.0 PICKUP TRUCK LOAD SECUREMENT

The Department of Transportation defines cargo as anything that can leak, blow, spill, fall, or shift from within the truck or trailer while in transit. As the driver, you are responsible for ensuring that all cargo is properly secured. Failure to properly secure your cargo can result in serious accidents and fines to the driver and the Company. If the cargo is too large for your truck, or multiple trips will be required (such as when demobilizing a project) contact the main office and ask for the Tool Manager or your PM for assistance (to schedule a larger truck to come to the site).

- All cargo, regardless of size, is to be secured from blowing, falling, or shifting from the bed of the pickup.

- The use of rope to secure cargo is prohibited. When cargo needs to be tied down, a ratchet strap, or a “SAFE Load” cargo net is to be used.
- Five gallon “safety cans” of gasoline or diesel fuel can be hauled in the back of a pickup if properly secured. No more than (8) “fuel cans” can be transported at once.
- Oxygen / acetylene tanks can only be hauled if in a secured, upright position. Regulators are to be removed and protective caps in place.
- Any item being transported that extends 3 feet or greater from the rear of the pickup truck’s bed must be marked with a red flag.
- If so equipped, utilize the cargo netting and ratchet strap system. If not available and cargo cannot be secured by a tie-down method, then cargo is not to be transported in the pickup truck and alternate means should be utilized by contacting the Tool/Materials Manager to arrange for a pickup and transport of the cargo, or via a third party transport vendor.
- If you fail to secure an item properly and it falls out of the back of your pickup truck, DO NOT attempt to retrieve the item from a busy roadway. Pull to the side of the road, put on your hazards, and call 911.

9.0 VEHICLE MAINTENANCE

The scheduling of any and all maintenance or repair(s), whether at the J. J. White, Inc. garage, or any other location must be discussed with, and approved by, the Equipment Maintenance Supervisor PRIOR TO initiating the same. Emergency repairs (only extreme/severe cases) will be excused. In case of breakdowns after hours, the Equipment Maintenance Supervisor can be reached by cell phone at (215) 416-3992. The Equipment Maintenance Supervisor is responsible to ensure that only certified mechanics are performing service on our vehicles. In addition, it is critical that all manufacturers’ recommendations are being followed so that warranties do not become void.

Proper vehicle maintenance is a critical element in any fleet safety program, not only to ensure a safe, road worthy vehicle, but also to avoid unexpected breakdowns and the costly repair expenses associated with them. Please note the following guidelines:

- If your company-provided vehicle will be unavailable to you for any period of time, it is **your** responsibility to find alternate transportation while the vehicle is being serviced.
- Registration and Inspection schedules are to be coordinated through the Equipment Maintenance Supervisor.
- Drivers of D.O.T. regulated vehicles are required to inspect their vehicle both prior to, and after, usage documenting and notifying the company mechanic of deficiencies found.
- In addition to inspections required by law for passenger vehicles, routine inspections of critical items, such as motor oil and filters, brakes, lights, tires, wipers, etc., must also be completed by drivers of ALL vehicles.
- All company-owned or rented vehicles will have a Vehicle Dashboard Safety Label secured in an unobstructed location on the dashboard that clearly displays vehicle operation safety reminders.
- The vehicle should be cleaned (interior & exterior) regularly to help maintain its good appearance for you and the company. A clean vehicle makes a good impression on customers.

- The vehicle manufacturer's maintenance schedule should be referenced and closely followed regarding recommended maintenance intervals.
- All maintenance must be coordinated through the J. J. White, Incorporated Equipment Maintenance Supervisor so that all vehicle maintenance can be conducted in a timely and efficient manner. (Yours is not the only company vehicle in the fleet; schedule maintenance in advance and keep to the schedule.)
- Credit cards must be used for payments on all work and maintenance completed on vehicles. Make sure the job number, license plate and proper signatures are all on the ticket before submitting as a reimbursable expense. This applies for Company owned vehicles or vehicles so leased in the name of the Company.
- Tires may not be purchased through outside vendors, except in the event of an emergency.
- Lube and oil/oil filter changes are to be done every 5000 miles. There is a corporate account set up with Pep Boys (Fleet Account # 80255856). This account receives priority service – next available bay, next available technician. In addition, lube and oil/oil filter change services are available at Jiffy Lube. When service is performed at any Jiffy Lube or Pep Boys, the receipt must be sent to the Equipment Maintenance Supervisor with the job number, truck number, and mileage annotated on the receipt.
- All supervisors are responsible for the condition, care, repair and maintenance of vehicles assigned to their respective jobs. The abuse or neglect of vehicles will not be tolerated and shall be cause for disciplinary action up to, and including, possible termination of employment.
- Under no circumstances are company vehicles to be used for anything other than company business.
- When transferring vehicles or equipment, be sure to note any needs for repair and notify the office.
- The project Superintendents will be responsible to ensure that a monthly vehicle inspection takes place on all J.J. White Inc. vehicles, including rental vehicles, operated by our employees on their sites. This inspection is to be documented on a Monthly Vehicle Checklist (see attached). The completed checklists are to be kept onsite for the duration of the project, and then forwarded onto the Equipment Maintenance Supervisor for record keeping. If any significant damage is identified at the time of inspection, the Superintendent is to immediately notify the Equipment Maintenance Supervisor of the nature of the damage(s). The Superintendent is to determine the significance of the damage based on health, safety or environmental risks.

10.0 ACCIDENT REPORTING

ALL incidents involving a company-owned/rented vehicle must be reported to the VP of Risk Management. If an incident involves injury or damage to a third party, the following steps should be performed in the order that they appear:

- Call for medical aid if necessary.
- Secure accident scene—pull onto shoulder or side of road.
- Call the police. All accidents, regardless of severity, must be reported to the police. If the driver cannot get to the phone, he/she should write a note giving location to a reliable appearing motorist and ask him/her to notify the police.
- Record names and addresses of drivers, witnesses, and occupants of the other vehicles and any medical personnel who may arrive at the scene.

- Contact Bill Nolan- Risk Manager, immediately and be prepared to supply him with the following information:
 - o License number of other drivers
 - o Insurance company names and policy numbers of other vehicles
 - o Make, year, model of other vehicles
 - o Date, time and exact location of accident
 - o Overall road and weather conditions
- Without obstructing traffic or the cleanup of the accident, use the J.J. White Accident Kit (if allowed in your vehicle) to take pictures of the vehicles, roadway and any traffic control devices & draw a diagram of the accident scene, noting the street names and locations of traffic signs, signals, weather conditions, etc. Supply this information to the VP of Risk Management as soon as possible, preferably within 48 hours of the incident.
- Do not discuss the accident with anyone at the scene except the police. Do not comment on fault or responsibility for the accident. DON'T argue with anyone.
- Provide the other party with your name, address, phone number, driver's license number, and insurance information.
- Cooperate fully with any follow-up from the J. J. White, Inc. Risk Management department, our insurance company and/or legal counsel, if assigned.
- Coordinate all Company vehicle repairs through the Equipment Maintenance Supervisor and the VP of Risk Management.
- Contact the local and/or state police agency which responded to the accident and acquire a copy of the written Accident Investigation Report and forward it to the VP of Risk Management.
- Effective January 1, 2006, any driver of a company-owned/rented vehicle who is determined to be more than 50% at-fault in a vehicular accident will reimburse the company for the first \$500 in damages to the vehicle in his/her custody. The deductible liability applies only to employees whom have been assigned Company vehicles which do not require a CDL operator license to operate.

11.0 TERMINATION

Upon the termination of your employment with J.J.White, Incorporated, you are required to return your company-owned/rented vehicle to the Equipment Maintenance Supervisor at 5500 Bingham St., Philadelphia, PA. The company will not be responsible for any personal items left in a vehicle thus returned.

12.0 PERSONAL VEHICLE EXPENSES & RECORD KEEPING

If you are an employee, who does not have an assigned J. J. White, Incorporated vehicle, but has been given a “Vehicle Rental Allowance” for the usage of your vehicle, you are expected to abide by all of the items listed above while utilizing your vehicle to further the business interests of J. J. White, Incorporated. Failure to abide by any of the rules set forth will result in the immediate termination of the Vehicle Rental Allowance. Other disciplinary actions may be taken as outlined above, including but not limited to termination of employment. Additionally, as an employee who has accepted a pre-determined rental reimbursement, this reimbursement is to be considered in lieu of any claim for the following:

- *** All reporting or tracking of mileage for the purpose of reimbursement by the Company.
- *** All costs associated with routine wear and tear and repairs to your vehicle.
- *** All expense reporting and/or claim for reimbursement for gasoline & maintenance.
- *** All other claims for personal use charges that may apply.
- *** Any claim for damages, or loss of any kind until your personal primary insurance has been exhausted.

Additionally, the vehicle so rented must be:

- *** Registered and titled (or leased) in your name.
- *** Legally licensed in the same state as your primary residence reflected on your operator’s license.
- *** Legally inspected, including a valid emissions certification, as per the vehicle’s State of registration.
- *** Insured under your name, with evidence of insurance supplied to the Company’s Safety Services Administration Manager on an annual, or at renewal, or at any time of upon request of the Company. An insurance declaration page must be provided as valid evidence of insurance, and must reflect a \$100,000.00 Property Damage Liability Limit, and a \$300,000.00 Bodily Injury Limit per vehicle so rented.
- *** Employee must supply a copy of a valid Driver’s License for the type of vehicle being operated/rented, and must keep it with them at all times.
- *** Employees rented vehicle will only be operated by the employee while furthering the course of employment of J. J. White, Incorporated.

Further, any mechanical or structural damage or evidence of disrepair of your vehicle that is deemed unsafe by the Company will result in the immediate termination of this allowance. The termination shall remain in effect until such time as the repairs have been completed and a reinstatement request has been received in writing by the Sr. Vice President of Operations, with the original repair invoices attached, and then only upon approval by the Sr. Vice President of Operations. Lastly, the Company reserves the right to terminate this allowance at any time for any reason.



J. J. White, Inc.
Fleet Safety Policy Statement

Management has developed this Fleet Safety Program in conjunction with industry best practices. The purpose of this policy is twofold: 1) to ensure the safety of our most important asset, our employees and 2) to eliminate, or at least minimize, the cost of vehicular accidents to our company.

It is the driver's responsibility to, at all times, operate the vehicle in a safe and courteous manner and drive defensively to prevent injuries and property damage. The company endorses, and all drivers are required to comply with, all applicable state motor vehicle regulations. The attitude you take when behind the wheel is the single most important factor in driving safely.

We will continue to seek to improve our program by utilizing current industry best practices and developing new ones in the areas of driver qualification & training, the establishment and observance of safe work rules and practices, safe vehicle operations and superior vehicle maintenance.

Through the extraordinary efforts of all of our employees, our Fleet Safety Program will continue to meet management's expectations and enable us to maintain our leadership role within the industry.

James Daley
President



J. J. White, Inc.
Motor Vehicle Record-Release Form

I acknowledge that the information contained in the company's Vehicle Fleet Safety Program has been reviewed by me and a copy of the program and driver rules have been furnished to me. As a driver of a company vehicle, or an employee who has been given a Vehicle Rental Allowance, I understand that it is my responsibility to operate the vehicle in a safe manner and to drive defensively to prevent injuries and/or property damage.

I also understand that my employer will periodically receive information on my Motor Vehicle Record to determine continued eligibility to drive a company vehicle, or to maintain my eligibility for Vehicle Rental Allowance. In accordance with the Fair Credit Reporting Act, I have been informed that a Motor Vehicle Record will be obtained on me for continued employment purposes and that, prior to taking any adverse action as a result of that report, I will be able to obtain a copy of said report.

I acknowledge the receipt of the above disclosure and authorize my employer or its designated agent to obtain a Motor Vehicle Record report. I understand this authorization is valid as long as I am an employee, or employee candidate, and may only be rescinded in writing.

PRINT - EMPLOYEE'S NAME

VEHICLE NUMBER

EMPLOYEE'S DRIVER'S LICENSE NUMBER & STATE
(Copy of License Must Be Attached)

VEHICLE MILEAGE

EMPLOYEE'S ADDRESS

LAST 4 OF SOCIAL SECURITY NUMBER

DATE OF BIRTH

EMPLOYEE'S SIGNATURE

DATE

SUPERINTENDENT'S/ REVIEWER'S SIGNATURE

DATE

(Sign and return this original form with a legible copy of your license to the Safety Services Administration Manager)

Attachment “A”



**J. J. White, Inc.
Fleet Vehicle Policy for U.S. Field Based Employees**

***PLEASE READ THOROUGHLY*
RETAIN THIS POLICY AND YOUR INSURANCE CARD IN
YOU GLOVE BOX FOR YOU REFERENCE**

J. J. White, Inc. Fleet

Contact: Andy Jones

I. INTRODUCTION

During your employment with J. J. White, Inc., J. J. White, Inc. may provide you with a vehicle to be used within the scope of your employment. This Fleet Vehicle Policy for U. S. Field Based Employees (this “Policy”) describes the terms and conditions under which you may be provided with a vehicle. As the driver of a J. J. White vehicle, you are responsible for reading this Policy and having a complete understanding of your responsibilities as they are described herein.

As you represent J. J. White, Inc. in the community, you must drive and maintain the vehicle as you would your own vehicle. In addition, you are responsible for the proper care and maintenance of the vehicle (See “Maintenance Procedures and Repairs” section below).

A. Fleet Administrator

J. J. White, Inc. has selected Enterprise Fleet Management to serve as the Company’s Fleet Administrator. As Fleet Administrator, Enterprise provides the following services to J. J. White, Inc. and its field-based employees:

- Vehicle Selection and Ordering
- Vehicle License and Registration
- Vehicle Maintenance
- Online Mileage Reporting
- Emergency Repairs and Roadside Assistance
- Car Rental Privileges

B. Replacement Procedures

Field based employees are responsible for returning their J. J. White, Inc. vehicle in good working condition. Accordingly, you must clean the car prior to returning it to the Fleet Administrator. A vehicle in “clean” condition obtains maximum trade-in allowance. Make sure you have your vehicle washed and thoroughly vacuumed inside, including the trunk, glove compartment and area under the seats. Remove all company and personal belongings.

III. VEHICLE MAINTENANCE

AS THE RECIPIENT OF J.J. WHITE'S VEHICLE, YOU ARE RESPONSIBLE FOR THE PROPER MAINTENANCE AND CARE OF THE VEHICLE. PLEASE REMEMBER TO DO THE FOLLOWING SCHEDULED MAINTENANCE CHECKS:

1. Change your oil every 6,000 miles.
2. Keep your tires inflated to the proper PSI rating. (This is usually 32-36 PSI, but you should check the owner's manual to be sure)
3. Enterprise will make recommendations on when you should rotate your tires.
4. Frequently inspect belts and hoses for cracks and leaks or loose fittings.

Neglect, intentional misuse or intentional disregard of the maintenance schedule of a J. J. White, Inc. vehicle may result in (I) disciplinary action and (II) reimbursement for any and all necessary repairs to the vehicle.

A. Maintenance Procedures and Repairs

It is your responsibility to have all scheduled maintenance performed on your J.J. White, Inc. vehicle at the designated intervals to ensure maximum vehicle performance for safety, operating efficiency, and extended life of the vehicle. Please refer to the Enterprise Driver Information handbook for more information on the maintenance program and approved service centers.

For major repairs, including towing and car rental, please call Enterprise National Service Department at 800-325-8838. They will handle repairs and direct you accordingly. It is important that you do not act independently of both the scheduled maintenance and the Enterprise managed maintenance programs. Any personal expenses incurred from doing so will be reviewed and may not be reimbursed. Any questions about the maintenance program should be referred to Amanda Cole at Enterprise at 610-230-5224.

B. Warranty

Each new J. J. White, Inc. vehicle carries a warranty that will cover repair or replacement of any defective parts by any authorized dealer. It is your responsibility as the operator of a company vehicle to protect J. J. White, Inc.'s interest and obtain "no charge" warranty repairs whenever possible. Carefully read and understand your vehicle warranty coverage. The various automobile manufacturers have different requirements regarding the validation of warranties on new automobiles. Question the dealer who delivers your vehicle as to how your warranty will be established.

Any questions concerning warranty coverage should be referred to an authorized dealer.

C. Tire Care and Replacement

The mileage is directly proportional to driver techniques, front-end alignment, tire pressure, and wheel balance. All of these factors are under your control. You should check your tire pressure at regular intervals and visually inspect your tires. You should correct front-end alignment and wheel balance problems immediately to avoid excessive tire wear. All J. J. White, Inc. vehicles will be delivered with radial tires which, with reasonable care, should last for a minimum of 30,000 miles.

D. Out-of-Pocket Expenses & Service Locations

Out-of-pocket maintenance and service expenses should be minimized. All maintenance and repair work should be charged to your Enterprise Maintenance card, unless pre-approved by Ed Scheidts, to ensure that the lowest prices and maximum warranties are obtained.

IV. QUESTIONS AND ANSWERS

- Q. How do I handle routine maintenance and repairs?
- A. Take your vehicle into an Enterprise authorized repair facility. Present your maintenance card to the service advisor. The shop will call Enterprise and complete the transaction with little or no involvement from the driver. If you are unsure about how to handle a specific repair or maintenance concern, please contact the National Service Department at 800-325-8838.

EMPLOYEE ACKNOWLEDGEMENT FORM

J. J. White, Inc. Fleet Vehicle Policy for U.S. Field Based Employees (Employee Copy)

I acknowledge that (I) I have received, read and understand the J. J. White, Inc. Fleet Vehicle Policy for U.S. Field Based Employees (the “policy”), (II) I will comply with the Policy, and (III) I will cause other authorized users of the vehicle under my control to comply with the Policy. I further acknowledge that my failure to do so may result in disciplinary action, up to and including termination of employment.

Signature

Print Name

Date

Keep this form for your records.

*Authorized drivers must be 25 years of age or older, and in possession of an authorized driver’s license.

Vehicle Receipt Acknowledgement Form

Fleet Vehicle Receipt Acknowledgement Form

To be completed, signed and sent to Nicole Keech via fax 855-205-2633 when the new vehicle is picked up.

| | | |
|----------------------------------|----------|-------|
| Driver Information | | |
| <hr/> | | |
| Name: | Phone #: | |
| <hr/> | | |
| Territory: | | |
| <hr/> | | |
| Phone number: | | |
| <hr/> | | |
| Vehicle Information | | |
| <hr/> | | |
| Date of vehicle receipt/pick-up: | | |
| <hr/> | | |
| Make: | Model: | Year: |
| <hr/> | | |
| VIN#: | | |
| <hr/> | | |

I _____ hereby acknowledge that I have picked up and received my J. J. White, Inc. Fleet Vehicle with the above VIN#. I have test driven the vehicle and checked that the vehicle meets the specifications ordered and that the car is in good condition to the best of my ability.

Signature: _____ Date: _____

PLEASE FAX TO: 855-205-2633
Within two (2) business days of receipt of vehicle

APPENDIX 21

HIGH-PRESSURE WATER EQUIPMENT SAFE OPERATION TRAINING

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I. Safety Precautions That Must Be Observed By the User

View the Video “**RECOMMENDED PRACTICES**” by the Water Jet Technology Association and **read this safety manual before operating any high-pressure water jetting components.**

DO NOT operate any high-pressure water jetting component or system without first understanding the **SAFETY ISSUES & CONCERNS**. If the **SAFETY MANUAL** is incomplete and / or you have concerns regarding your health & safety upon conclusion of this training, call Robert Celestino at J. J. White, Inc., 215-722-1000 before operating the equipment.

Safety Signs :

All J. J. White, Inc. high-pressure water-jetting equipment has safety signs strategically placed on the equipment. If any become marred, painted over, or in any manner unreadable, contact J. J. White, Inc. for replacements. These signs are furnished as an aid to training employees and as a reminder to operators and their fellow employees. The safety signs are not intended to be used as a substitute for a specific company training program covering the operation and safety of the equipment. It is the supervision's responsibility to call these signs to the attention of all personnel.

I.A. Operator Safety Equipment

J. J. White, Inc. provides complete operator safety suits for high-pressure water blasting operations and requires the use of all safety equipment that is provided.

CAUTION : THE USE OF HEARING PROTECTION IS ALSO REQUIRED WHEN OPERATING THIS EQUIPMENT.

I.B. Pre-Service Safety Check

The Pre-Service Safety Check List (Appendix 5) is attached to all J. J. White, Inc. high-pressure water jetting units. If it becomes marred, painted over, or in any manner unreadable, contact J. J. White, Inc. for a replacement.

Identical printed forms are available from J. J. White, Inc. In addition to visually checking off the information on the unit decal, the job foreman should also fill out and sign (1) of the printed forms to be maintained in the company project file.

I.C. Recommended Safety Procedures Decal

The recommended Safety Procedures Decal (Appendix 6) is attached to all J. J. White, Inc. high-pressure water jetting units. If it becomes marred, painted over, or in any manner unreadable, contact J. J. White, Inc. for a replacement.

II. Safety Aspects of High-Pressure Water Cleaning Systems

For maximum operational Safety, the following equipment and manual procedures must be used where applicable :

II.A. Equipment

1. **High-Pressure Pump** – The principal component of the high-pressure water jetting cleaning system is usually a positive displacement high-pressure pump which discharges water into a common manifold to which flexible hoses or lances with nozzles or other cleaning or cutting accessories are attached. The pumps are appropriately powered and can be either mobile or permanently mounted. They shall never be operated above equipment manufacturer recommended operating pressure.
2. **Relief System** – The system shall be equipped with an automatic relief device on the discharge side of the pump, adjusted so that the maximum allowable working pressure of the system is not exceeded by more than 3%.
3. **Pressure Gauge** – The system shall be equipped with a gauge to indicate the pressure being developed.
4. **Filter or Strainer** – The water system shall be equipped with a filter or strainer to prevent particles from entering the high-pressure pump and damaging the plungers.
5. **Dump System** – The system shall be equipped with a device, which will bypass the flow or dump the discharge pressure to a safe level immediately when actuated. An operator shall control this dump system.
6. **Hose Assembly** – Hose assemblies used on the discharge side of the pump shall have a safety factor of 3.0 based on the manufacturer's rated minimum burst pressure.
7. **Fittings / Valves** – All fittings and valves used on the discharge side of the pump shall have a safety factor of 3.0 based on the tensile strength of the material.
8. **Electrical Controls** – All electrical controls handled by personnel shall be either fail safe, low voltage, or protected with an approved ground fault circuit interrupter.

II.B. Personal Protective Equipment

It is essential that each operator wear the appropriate protective equipment to accomplish the job safely. The following is a list of J. J. White, Inc. recommended safety equipment :

1. **Body Protection** – “Turtle Suits” shall be worn by all personnel engaged in Manual HPWW activities. It is mandatory PPE for this work. The turtle suit requirement can only be waived after completing an Exchanger Variance Form. And have it signed by all required parties listed on the form.
2. **Head Protection** – Head protection shall consist of an ANSI approved hard hat.
3. **Eye and Face Protection** – Eye and face equipment will consist of a wraparound face shield and safety glasses, or a face shield and monogoggles.
4. **Foot Protection** – Steel-toed boots are required. Metatarsal foot guards are available as well.
5. **Hand Protection** – PVC or other chemical resistant gloves must be worn.
6. **Ear Protection** – Ear plugs or other suitable protection must be worn when noise levels exceed OSHA recommended levels.

The Safety Coordinator should be consulted prior to starting work to determine potential environmental and / or personal problems peculiar to that specific task. If any are determined to exist, appropriate action must be taken prior to starting the job.

II.C. Equipment Staging & Housekeeping for Wash Pad

1. **Pumps** – Stage the hydro-blast pumps in an area with minimal traffic. If there is more than one pump, stage them side-by-side in a neat row.
2. **Hoses** – High Pressure hoses from the pumps to the equipment on the pad shall be run on the outer edge of the pad if possible, and every effort should be made to run the hoses in areas with minimal foot traffic exposure. Use roadway hose covers wherever foot or vehicular traffic egress / access path is encountered. Hoses shall be run together and

utilize as few hoses as possible. This may require connecting multiple pumps together to reduce the number of hoses.

3. **Housekeeping** – During the washing activities, continue to wash down the pad with water and do not allow waste and material to accumulate on the pad.
4. **Inclement Weather & Night Shift** – During the winter months, to avoid ice accumulation on the pad, rock salt or hot water may be used; be sure to check with the owner. Temporary lighting may be needed to increase visibility on the pad. Be sure to stage this equipment far enough back on the edge of the pad, probably in close proximity to the pumps. To eliminate the collection of moisture on the face shield, products such as Rain-X may be used to increase visibility. Be sure to check with the manufacturer and the safety department to make sure the product doesn't reduce the protection factor of the face shield. Application of Rain-X should be done prior to donning the face shield.

II.D. Pre-Operational Procedures

1. **Planning** – Pre-job planning shall take place prior to the start of any job. Personnel familiar with the equipment to be cleaned and the environment of the work area shall meet with the personnel who will be doing the cleaning or cutting and outline the potential hazards of the work area, environmental problems, and safety standards by completing a JSSA and a High Hazard JSA prior to the start of work (see Appendix 1).
2. **Cleaning Method and Equipment List** – A list of equipment and cleaning methods shall be determined to develop a training agenda for each method and piece of equipment to be used.
3. **Barricades** – Barricades shall be erected to enclose hazardous areas. Barricades may be rope, safety tapes, barrels, etc., as long as they provide an effective visible and physical obstacle. Signage is available in Appendix 4.
4. **Hook-Up** – Inspect all hoses and fittings for evidence of excessive wear and damage prior to installing. Hoses should be laid out in a safe and orderly manner. Hoses, pipes, and fittings shall be supported to prevent excessive sway, vibration, or stress on end connections. Hoses should be protected to prevent kinking or excessive wear.
5. **Nozzles** – Before installing the nozzle, the system shall be completely flushed with sufficient water to remove air and foreign particles. Inspect all nozzles for damage and / or plugged orifices before installing. The high-

pressure water jetting unit should be shut off and disconnected before installing nozzles.

II.E. Operational Procedure

1. **Work Area** – All personnel working or entering the barricaded area while cleaning or cutting is in progress shall wear the required protective equipment in accordance with the job conditions.
2. **Pressuring System** – Pressure shall be increased slowly on the system while being inspected for leaks and / or faulty components. All leaks or faulty components shall be repaired or replaced. System shall be depressurized to effect repairs.

CAUTION : NEVER LEAVE THE SYSTEM UNATTENDED WHILE PRESSURIZED!

II.F. Inspecting Exchangers & Rolling Exchangers

1. Obtain weight of clean exchanger.
2. Once the exchanger has been removed from its shell, verify the added weight to the exchanger due to built up product.
3. Inspect the condition and configuration of the exchanger. Visually inspect tube sheet for obstructions, condition of baffles, what type of baffles, and finally if there is any visual build up that can be seen on the outer diameter (OD) of the tubes (possible heavy spots).
4. Chock and fasten the exchanger down and transport to the dedicated wash pad for cleaning.
5. Set your rollers at the appropriate distance.
6. Verify that the rollers are marked and the weight of the exchanger is within its limitations.
7. Barricade of the area with **RED DANGER TAPE**. Only essential personnel are permitted to be within the barricade.
8. Pick the exchanger from the extractor truck and set down on the rollers.

Note : Prior to breaking free the rigging, ensure the exchanger is sitting evenly on the rollers and that there are no obstructions. In the event that there are obstructions, such as nozzles or welded on lifting lugs, they may

- need to be removed or a separate frame may need to be fabricated to sit on the rollers. Prior to supporting the exchanger by setting the baffles down on the rollers, have the owner's representative verify that this is acceptable. Check to ensure that the baffle uniformly encompasses the exchanger. Half baffles are common and could result in the exchanger coming off the rollers during rotation and placement. Place both rollers in the free-wheel stage and slowly come down on the load to see if there are any heavy spots that will attempt to roll the exchanger on its own. Personnel must be aware of the hazard and position themselves in front of the tube sheets, not on the sides.
9. Once any heavy spots have been identified, keep the rigging secured to the load, chock the load where the heavy spot would rest on top, and attempt to break free the heavy spot with the HPWW equipment.
 10. To verify that the heavy spot has been removed, repeat the act of coming down on the load while both rollers are free-wheeling to see if the exchanger wants to roll on its own.
 11. Once any heavy spots have been removed, the cleaning process will begin with cleaning the OD of the tubes followed by the inner diameter (ID) of the tubes.
 12. When working with an exchanger that is unable to rotate on the hydraulic rollers due to surface area or residual product on the rollers, the following are (2) accepted practices :
 - a. While the hydraulic roller is still active, attach the exchanger with rigging to the hook on the side wash machine. Slowly apply tension to the rigging, at the same time, the hydraulic rollers are engaged, until the exchanger catches on the rollers. Be sure to rig the exchanger so that when the exchanger does catch the rollers, it is rolling towards the rigged side where the rigging would now have slack in it. As soon as the exchanger begins to roll on the hydraulic roller, stop and remove the rigging.
 - b. Place both rollers in free-wheel. Attach the exchanger with rigging to the crane and manually roll the exchanger. After each quarter turn, chock the load and remove the rigging.

II.G. Training

1. **Cutting Action** – Demonstrate the cutting action and potential hazard involved through the use of audio-visual aids or actual use of the equipment. Cut through a piece of lumber, dissect a grapefruit, etc.

2. **Personal Protective Equipment** – Explain the minimum personal protective equipment required. Instruct *when* and *how* specific limb guards, special clothing, and other types of devices should be worn per type of work performed, locations, etc.
3. **System Operation** – Explain the operation of the system, pointing out potential problems and proper corrective action.
4. **Safety Devices** – Explain the reason for, and operation of, safety devices. Stress the importance of not tampering with any safety devices.
5. **Hoses** – Explain the proper method of connecting hoses, including lying out without kinks, protection from excessive wear, and proper tools to use on couplings and fittings.
6. **General** – The system shall be depressurized any time it is not in use, any time an unauthorized person enters the barricaded area, or when any replacement or repairs are made to the system.

III. Recommended Practices for the Use of Manually Operated High-Pressure Water Jetting Equipment

III.A. Introduction

These recommended practices cover the personnel requirements, operator training, operating procedures, and recommended equipment for the proper operation of all types of high-pressure water jetting equipment as normally used by industries concerned with construction, maintenance, repair, cleaning, and demolition work. Attention is drawn to the relevant or proposed OSHA, ASTM and ANSI standards. It is intended that extension to this code will be produced in due course to cover specialist applications (e.g., multiple gun operation, pulsed jets, cutting with the use of abrasives and high-pressure intensifiers) but in the meantime, these practices should be used as far as practicable.

The use of high-pressure water jets for cutting and cleaning is a rapidly evolving technology with current developments occurring. For this reason, these practices are dated and the association shall bi annually review these practices for any required changes.

III.B. Scope

1. The recommended practices are intended to provide guidance on the proper operation of high-pressure water jet cleaning and cutting equipment.

2. In this document, the word "shall" indicates a requirement that is to be adopted in order to comply with these recommended practices.
3. The term "high-pressure water jetting" covers all water jetting, including the use of additives or abrasives at pressures above 1000 psi, approximately.
4. These recommended practices are also applicable at lower pressures where there is foreseeable risk of injury. As a guideline, the recommended practices are applicable where the product of pressure, measured in psi, times flow, measured in gallons per minute, exceed 2,000 psi times gpm.
5. Any person required to operate or maintain high-pressure water jetting equipment shall have been trained and have demonstrated the ability and knowledge to do so prior to performing hydro-blasting work.

III.C. Definition of Terms

1. **High-Pressure Water Jet Systems** – High-pressure water jet systems are water delivery systems which have nozzles or other openings whose function is to increase the speed of liquids. Solid particles or additional chemicals may also be introduced, but the exit, in all cases will be a free stream.

In terms of these recommended practices, the "system" shall include the pumps (pressure producing devices) and the hoses, lances, nozzles, valves, and safety devices, as well as any heating elements or injection systems attached thereto.

2. **High-Pressure Water Cleaning** – The use of high-pressure water, with or without the addition of other liquids or solid particles, to remove unwanted matter from various surfaces where the pressure of the liquid jet at the orifice exceeds 1,000 psi.

Caution: The lower limit of 1000 psi does not mean that pressures below 1000 psi cannot cause injury or require any less attention to the principles of these recommended practices. Adequate precautions, similar to those of these recommended practices, are required at all pressures.

3. **High-Pressure Water Cutting** – The use of high-pressure water, with or without the addition of other liquids or solid particles, to penetrate into the surface of a material for the purpose of cutting that material, and where the pressure of the liquid jet exceeds 1,000 psi.

4. **Lancing** – An application whereby a lance and nozzle combination is inserted into and retracted from the interior of a pipe or tubular product.
5. **Dump System** – An operator controlled, manually operated device or system that rapidly reduces the pressure to a level that yields a pressure flow at the nozzle that is considerably below the risk threshold.
6. **Moling** – An application whereby a hose, fitted either with a nozzle or with a nozzle attached to a lance, is inserted into and retracted from the interior of a tubular product. It is a system commonly intended for cleaning the internal surfaces of pipes or drains. It can be self-propelled by its backward directed jets, and is manufactured in various shapes, sizes and combinations of forward and backward directed jets.
7. **Nozzle** – A device with one (1) or more openings where the fluid discharges from the system. The nozzle restricts the area of flow of the liquid, accelerating the water to the required velocity and shaping it to the required flow pattern and distribution for a particular application. Combinations of forward and backward nozzles are often used to balance the thrust. Such nozzles are commonly referred to as tips, jets, orifices, etc.
8. **Competent Person** - The Competent Person will be responsible for all aspects of the HPWW job. J. J. White, Inc. has outlined the requirements to be deemed the Competent Person on the job. The Competent Person shall not be the Site Superintendent or Safety Professional. The Competent Person shall be a full time J. J. White, Inc. employee; have three (3) consecutive years of continuous employment with J. J. White, Inc., be knowledgeable in all the J. J. White, Inc. rules and the facility specific rules for HPWW where the job is running; and complete this training.
9. **Operator** – A person who has been trained and has demonstrated the knowledge and experience to perform the assigned task.
10. **Operator Trainee** – A person who is not qualified due to the lack of knowledge and / or experience to perform the assigned task without supervision.
11. **Shotgunning** – An application whereby a lance and nozzle combination can be manipulated in virtually all planes of operation.
12. **Hose Assembly** – A hose with coupling attached in accordance with manufacturer's specifications.

13. **Lance** – A rigid metal tube used to extend the nozzle from the end of the hose.

III.D. Equipment Definitions & Standards

1. **Pressurizing High-Pressure Pump** – A unit designed to deliver high-pressure water or other fluid. This is usually based on positive displacement pistons or rubber diaphragm/ hydraulic systems, and discharges water in to a common manifold to which either flexible hoses, or rigid tubing, connected to lances or nozzles are attached. These high-pressure pumps can either be mobile or permanently mounted.

A system is not to be operated above the lowest working pressure (40% of the burst pressure) of any of its components.

The pump should have a permanently mounted tag or tags providing the following information :

- a. Product and supplier.
 - b. Production model and serial number.
 - c. Maximum performance in terms of flow – measured in gallons per minute (gpm) and pressure measured in pounds per square inch (psi).
 - d. An outline of recommended safety procedures.
2. **Relief System** – The system shall be equipped with an automatic relief device on the discharge side of the high-pressure pump.
3. **Automatic Pressure Relief Devices** – These may take the form of :
- a. **Pressure Relieve Valve (Bypass Valve) or Bursting Disc (Rupture Disc) in Holder** – Usually mounted on the pump discharge chamber to prevent the pressure from exceeding the rated maximum pressure of the whole system.
 - b. **Automatic Pressure Regulating Valve (Unloading Valve)** – Limits the pressure at which the high-pressure pump operates by releasing a preset portion of the generated flow back to the pump suction chamber or to waste. It may be used to regulate the water pressure from the pump and is individually set for each operation. This device may be integral with the pump hydraulic assembly.

Where there is no demand for pumpage, the water pressure is brought down to zero.

- c. **Bypass Valve** – A device which can be adjusted to control the flow, and thus the pressure, of the jet stream issuing from the nozzle by bypassing the excess flow to another circuit.
- 4. **Pressure Gauge** – The system should be equipped with a gauge indicating the pressure being developed. Gauges shall have a scale range of at least 50% above the maximum working pressure of the system.
- 5. **Filter or Strainer** – The water system should be equipped with a filter or strainer to prevent particles from restricting the orifices in the nozzle. The filter or strainer should be capable of removing particles smaller in size than the smallest orifice in the nozzle, and usually smaller to protect high-pressure pumps, etc.
- 6. **Dry Shut-Off Control Valve** – This operator-controlled valve, normally hand-controlled, automatically shuts off flow to the lance and / or nozzle assembly when released by the operator, but retains the operating pressure within the supply line when so shut-off. This valve shall be used in systems with an automatic pressure regulating valve.

Caution : Care should be taken to release the pressure in the dry shut-off valve and line when the pump is shut down, otherwise the valve operating lever may remain active.

This valve may alternatively be actuated by solenoid or pilot pressure mechanism.

- 7. **Dump System** – The system should be equipped with a device, which will shut down the unit, idle it to a safe rpm, bypass the flow, or reduce the discharge pressure to a low level. The dump system actuator device should be shielded to preclude inadvertent operation. This device should immediately shut off the high-pressure water stream if the operator loses control.
 - a. **Dump Control Valve** – This operator-controlled valve, normally hand-controlled, automatically terminates significant flow to the lance and / or nozzle assembly when released by the operator, thus relieving the operating pressure within the whole system by diverting the flow produced by the pump to atmosphere. A valve size should be selected that will not cause generation of significant back pressure at the maximum possible pumping rate of the pump. This valve may alternatively be actuated by solenoid or pilot pressure mechanism.

- b. **Solenoid and Electronically Operated Control Dump Systems** – All electrically controlled dump systems should be of failsafe design. Voltage of an alternating current (AC or direct DC) dump system handled by personnel should not exceed 24 volts.
- 8. **High-Pressure Hose** – This is a flexible hose which connects (2) components and which delivers the high-pressure fluid to the gun or nozzle components. The hose should have a burst rating of a minimum of two and one-half (2.5) times the intended working pressure. Operating levels below this ratio should require a protective shielding around that hose. The hose should be marked on (1) end with the manufacturer's symbol, the serial number, and the maximum permissible operating pressure and test pressure. The high-pressure hose should be tested at one and a half (1.5) times the working pressure.
- 9. **End Fittings and Couplings** – high-pressure hoses, end fittings, and couplings shall be manufactured to be compatible with the hose and tested as a unit.
- 10. **Jetting Gun Extension** – This is a length or lengths of tube carrying high-pressure fluid to the nozzle. Each shall be manufactured from suitable material for the application. End connections shall be suitable for the application. The extension is used in conjunction with a control valve. The extension shall have a minimum burst strength of at least two and a half (2.5) times the highest actual operating pressure being used.
- 11. **Nozzle** – The nozzle creates the water jet, or jets, at the required velocity, flow rate, pressure, shape, and distribution for a particular application. Combinations of forward and backward directed water jets are often used to balance the thrust. Such nozzles may be referred to as tips, jets, or orifices.
- 12. **Water Jets** – A jet stream of water produced from the individual outlet orifice of a nozzle. The form of the orifice determines the shape of the jet while the speed at which it travels is determined by the orifice design, orifice area, and flow. The pressure drop at the orifice is a result of an increase in velocity. The most commonly used jet shapes are the straight-jet and fan-shaped jet.
 - a. **Straight Jet** - Concentrates the stream of water over a small area of the work piece by minimizing the spread. A typical application is for cutting or for general cleaning of matter with higher shear and / or bond strength.

- b. **Fan Jet** – Spreads the stream of water in (1) plane, so giving a wide band coverage of the work piece. A typical application is for cleaning larger areas requiring less energy to remove unwanted matter.

13. **Jetting Hand Manifold and Spray Bars** – These are pieces of equipment into which individual nozzles are fitted.

14. **Foot Control Valve** – The lance / gun operator's control valve may be arranged for actuation by the operator's foot if desired, either in place of, or in conjunction to the hand control.

An adequate guard should be fitted to prevent accidental operation and the base plate area should be sufficient to ensure stability in use. If on the dump type, the layout should ensure that the dump line, if used, is restrained from whipping when the valve is released.

15. **Jetting Gun** – A portable combination of operator's control valve and nozzle, which resembles a gun in layout and outline.

The control valve is hand-operated, generally by a squeeze action of the hand of the operator, who should always have control of this device and may be of the dry shut off or dump type, the gun being named accordingly. The hand-control normally takes the form of a trigger or lever which should be provided with either a guard adequate to prevent accidental operation, or the means of being immobilized in the "OFF" position by means of a safety catch. The gun may be fitted with a shoulder pad or hand grips to facilitate back thrust control.

The minimum total length of a hydro-blasting gun (hand-operated control valve, lance and nozzle resembling a gun layout) shall be 66 inches from the shoulder pad to the nozzle.

16. **Retro Gun** – A retro safety gun is fitted with the forward and backward facing jets. This reduces the thrust experienced by the operator. This type of gun is used mainly for underwater high-pressure water jetting operations. The retro balance jet protection tube should be sufficiently long or constructed so as to prevent the operator from directing a retro balance jet himself.

17. **Changeover Valve** – An operator-controlled valve designed to properly direct high-pressure water flow from the pump to (1) or another items of equipment at the operator's choice. It shall be designed to withstand the maximum pressure and can be power operated.

III.E. Care and Maintenance of Equipment

1. **High-Pressure Water Jetting Unit** – The unit shall be maintained in accordance with manufacturer and or J.J. White, Inc. instructions. Where applicable, this should include daily checks on the following items:
2. **Drive** – Lubricating oil, water, hydraulic fluid, and fluid levels.
3. **High-Pressure Pump** – Lubricating oil and gear box oil levels.
4. **Hydraulic Hose Reel** – Lubricating oil and fluid levels.
5. **Condition of Guards and Shields** – Wear and / or damage.
6. **Filters and Strainers** - All water filters should be checked at regular intervals, dependent upon the supply water conditions and in accordance with manufacturer / J.J. White, Inc. recommendations. Extreme care should be taken to filter the water source through proper micron filtration, to prevent foreign particles from cutting changeover valves and seating surfaces and to prevent clogging the changeover valve operating mechanism. Such clogging can cause a loss of control, which can be dangerous to the lance / gun operator.
7. **Hose Assemblies** – All hose assemblies shall be inspected prior to use with respect to the following :
 - a. Correct pressure rating and size.
 - b. Free from external damage - e.g., exposed or broken wires.
 - c. All end fittings and couplings are in good order and of the correct pressure rating for the unit operating pressure.
8. **Nozzles** – All jetting nozzles shall be kept clean and the orifice shall be checked to ensure that it is not obstructed or damaged before installation. Defective nozzles shall not be used but should be replaced or repaired before installation. During the start-up and prior to operation, the nozzle should be removed from the lance and the system flushed thoroughly to remove air and foreign particles.
9. **Jetting Guns and Lances** – Jetting guns and lances shall be checked daily and the trigger mechanism and guard given a thorough visual examination to ensure correct operation. All high-pressure connections should be observed during operation of the equipment at peak pressure. If a leak is observed, the high-pressure water jetting unit shall be shut down and the connection repaired or replaced before further operation.

10. **Foot Control Valves** – All foot control valves shall be checked and cleaned daily and the foot mechanism and guard given a thorough visual examination to ensure correct operation.
11. **Electrical Equipment** – All electrically operated high-pressure water jetting units shall be checked daily for external damage with special emphasis placed on connection, junction boxes, switches, and supply cables. Care should be taken to ensure that the electrical system is protected from the ingress of water. Correct direction of rotation of the electric motor should be checked on initial installation and after every re-connection.
12. **Trailers** – Mounted high-pressure water jetting units shall be checked daily examining tires, braking systems, jacking points, towing hitch, lights, safety chains, structural damage, and general cleanliness. Only vehicles fit for the purpose should tow the units
13. **Engine Controls** – All throttle cables and engine stop devices shall be checked daily to ensure that they are functioning properly.
14. **Maintenance Servicing and Repair** – The following operations should only be carried out by competent personnel:
 - a. Manufacturer and or J.J. White, Inc. servicing requirements
 - b. The following items should be overhauled and checked for correct functioning at manufacturer's recommended intervals:
 - i. Pressure relief valve (bypass valve).
 - ii. Bursting discs (rupture discs).
 - iii. Pressure control valve.
 - iv. Hand or foot operated dump control valve, shut off control valve.
 - v. Dry shut off valve or dump system.
 - vi. Changeover valve.
15. **Tools** – When maintaining or assembling high-pressure water jetting systems, the correct size tools must be used. The use of adjustable tools with serrated gripping jaws, (e.g., pipe wrenches) which can damage equipment, is not recommended, particularly on the crimped portion of a hose fitting.

16. **Compatibility** – All component parts and fittings should be checked to ensure they are of the correct size and rating for the unit.

III.F. Protective Clothing and Personnel Protection

1. **OSHA Compliance** – All applicable OSHA regulations covering personal protective equipment shall be followed.
2. **Head Protection** – All operators shall be issued with suitable head protection, which shall be worn, where possible. This should also include a full face shield.
3. **Eye Protection** – Suitable eye protection (i.e., adequate for the purpose and of adequate fit on the person) shall be provided to all operators of high-pressure water jetting equipment, and must be worn within the working area. Additionally, several states have regulations governing eye protection, which must be conformed with. Double eye protection is **ALWAYS** required when cleaning.

CAUTION: WHERE LIQUIDS LIKELY TO CAUSE EYE DAMAGE ARE ENCOUNTERED, A WRAP-AROUND FACE SHIELD AND CHEMICAL GOGGLES UNDER THE SHIELD MAY BE REQUIRED. CHECK WITH YOUR SUPERVISION OR SAFETY PROFESSIONAL FOR GUIDANCE.

4. **Body Protection** – All operators shall be supplied with a “Turtle Suit”. This suit is able to withstand accidental contact with a water stream from HPWW activities. Turtle Suits shall be worn by all personnel engaged in manual HPWW activities where personnel are in a “hands on” mode of cleaning. Only personnel using automated HPWW machinery are exempt from wearing Turtle Suits. If chemical suits are required PPE for the task at hand, the chemical suit shall be worn over the turtle suits whenever possible to prevent contamination of the suit. Garments should provide full cover to the operator, including the arms. Any deviation from this requirement requires an Exchanger Variance. This Variance shall be signed by all parties listed on the variance BEFORE work without a turtle suit may begin. See Appendix 2 for the variance form.
5. **Hand Protection** – Adequate hand protection should be supplied to all operators and shall be worn when there is a reasonable probability of injury that can be prevented by such equipment.
6. **Foot Protection** – All operators should be supplied with waterproof boots with steel or aluminum toe-caps. A metatarsal guard should also be used by water jetting lance / gun operators.

7. **Hearing Protection** – Most high-pressure water jetting operations produce noise levels in excess of 90 dB, consequently, suitable ear protection issued in accordance with OSHA standards must be worn and provision should be made for its regular inspection and maintenance. All personnel and operators should receive instruction in the correct use of ear protectors so that noise exposure ties within the limits as specified by OSHA.
8. **Respiratory Protection** – A respiratory protection program shall be implemented where there is a reasonable probability of injury that can be prevented by such a program.
9. **Equipment Limitations** – It should be recognized that protective equipment may not necessarily protect the operator from injury by direct high-pressure water jet impact.

III.G. Pre-Operating Procedures

1. **Planning** - Each job shall be preplanned. Personnel familiar with the equipment to be cleaned or the material to be cut and the work environment shall meet with the personnel that will be doing the work and outline potential hazards of the work area, environmental problems, safety standards, and emergency aid procedures. A JSA and a High Hazard JSA shall be completed prior to the start of work (see Appendix 1).
2. **Cleaning Method and Equipment List** – A list of equipment and cleaning methods shall be determined to develop a training agenda for each method and piece of equipment to be used (see Appendix 5).
3. **Dump Valve** - All systems shall incorporate at least (1) fluid shut off or dump device. The lance operator must always be able to shut down the water jet by releasing pressure on the trigger, switch, or foot valve pedal.
4. **Warning Barriers** - Barricades shall be erected to encompass the hazard area and signs posted (see Appendix 4) to warn personnel that they are entering a hazardous area. The perimeter should be outside the effective range of the water jet wherever possible. Barriers may be of rope, safety tape, barrels, etc., as long as they give an effective warning and are highly visible.
5. **Hook-up**
 - a. **Hose** – The hose shall be arranged so a tripping hazard does not occur. Hoses, pipes and fittings shall be supported to prevent excessive sway and / or wear created by vibration or stress of the end connections when laid on the ground, over sharp objects, or on

vertical runs. All hoses shall be checked for evidence of damage, wear, or imperfection. Use roadway hose covers wherever foot or vehicular traffic egress / access path is encountered. The check shall be made periodically during the operation.

- b. **Fittings** – All fittings shall be cleaned and lubricated before being installed in the system. Be sure all fittings, hoses, and nozzles are fit for the purpose.
- c. **Pre-Flushing** – The system shall be completely flushed with sufficient water to remove any contaminants before installing the nozzle.
- d. **Nozzle** – All orifices shall be checked in all nozzles for any stoppage, damage, or imperfections.
- e. **Electrical Equipment** – Any electrical equipment in the immediate area of the operation that presents a hazard to the operator shall be de-energized, shielded or otherwise made safe.

III.H. Procedures

- 1. **Work area** – Where practical, work pieces to be jetted should be removed from plant areas to a high-pressure water jetting area. Where this is impractical, cutting or cleaning in place, or adjacent to the installed position, can be done with the necessary clearance and permission of the owner.

- a. **Area Limits** – Area limits applicable to the cutting or cleaning operations shall be defined and the team shall mark these limits by barriers and notices to warn against access to other personnel. Suitable barriers shall be an approved form of hazard warning, rope or tape, as a minimum. Alternatively, a suitable barrier shield is acceptable at any reasonable distance. Notices should state the following (or in other suitable wording) :

“DANGER – KEEP CLEAR, HIGH-PRESSURE WATER JETTING IN OPERATION”

- b. **Corrosive Materials** – Where there is a possibility of encountering corrosive or toxic materials, the owner shall be requested to inform the person in charge of high-pressure water jetting of any precautions that may be necessary, including the collection and disposal of waste materials.

- c. **Work surface** – Operators should have good access to the work piece, a safe working platform and secure footing. The area in which work is to proceed shall be kept clear of loose items and debris to prevent tripping and slipping hazards. Winter weather hazards can create slippery surfaces. Ice melt and shoe cleats should be readily available. No ladders, step stools, benches, etc. are to be used. Use only approved scaffolding or platforms that are job specific.
 - d. **Access** – Access by unauthorized persons into the area where high-pressure water jetting is taking place shall be prevented. The area shall be cordoned off and warning notices displayed in prominent positions. The perimeter should be outside the effective range of the water jet wherever possible.
 - e. **Approaching the Operator** – The occupier shall be requested to inform all personnel likely to require access to the area that high pressure water jetting is in progress. Personnel having reason to enter the water jetting area should wait until the water jet is stopped and his presence is made known. Personnel wishing to have the jet stopped shall approach a team member other than the lance / gun operator. The lance / gun operator shall not be distracted until the water jet has been stopped.
 - f. **Side Protection** – Target and side shields shall, where feasible, be suitably placed to safeguard personnel and equipment against contact with grit or solids removed by water jets.
 - g. **Protective Equipment** – All personnel working or entering the barricaded area while cleaning or cutting is in progress shall wear the required protective equipment.
2. **Pressurizing the System** – Pressure shall be increased slowly on the system while being inspected for leaks and / or faulty components. All leaks or faulty components shall be repaired or replaced. System shall be depressurized for repairs.
3. **Team Operations** – In most water jetting operations, it is accepted practice to employ a minimum of (2) persons.
- a. **Supervision** – a supervisor who is trained in all aspects of the high-pressure water jetting operation shall control all high-pressure water jetting operations.
 - b. **Number of Operators** – The operation of the high-pressure water jetting equipment should be by (2) or more operators according to

the equipment being used and the nature of the job. These operators shall work as a team with (1) member in charge. The operator of the gun or lance (as defined below) shall take the lead role while jetting is in progress.

- c. **Lance / Gun Operator** – (1) operator from the team shall hold the lance / gun or delivery hose with the nozzle mounted on it. His primary duty is to direct the water jet.
- d. **Second Operator** – The second operator of the team shall attend the high-pressure water jetting unit, keep close watch on the first operator for signs of difficulty or fatigue and watch the surrounding area for intrusion by other persons or unsafe situations. If required, he will shut off the pressure until it is safe to continue. Caution should be exercised in shutting off the pressure rapidly as this can cause the loss of footing by the lance / gun operator.
- e. **Additional Operators** – Further operators are required in the following circumstances :
 - i. To assist the first operator with the handling of the lance if it is too long or too heavy for (1) person.
 - ii. To provide communication if the lance operator is out of sight of the high-pressure water-jetting unit operator.
- f. **Job Rotation** – The team members should rotate their duties during any job to minimize fatigue to the operator holding the lance / gun.
- g. **Team Leader** – The team leader is responsible for basic equipment checks (as detailed below), the preparation of the working area for safe operation and for obtaining a permit to work where and when required. A hydro-blasting permit must be developed by J. J. White, Inc. personnel or by the site.
- h. **Code of Signals** – Before starting a high-pressure water jetting operation, the team members – (1) of whom must be in charge – shall agree on a code of signals to be used during the operation of the equipment.
- i. **Fitness** – The operator and other team members shall be physically and mentally capable of performing the required operations.

4. **Single person operation** – Single person operation is allowed where the pressure does not exceed 2,000 psi and the flow is less than 20 gpm.

All other recommendations pertaining to team operations shall hold true.

5. Shotgunning

- a. **Attendance** – The system shall never be left unattended when pressurized.
- b. **Multiple Operation** – When more than (1) shot gunning operation is being performed within the same area, a physical barrier shall be installed or adequate spacing between operators shall be maintained to prevent the possibility of injury from the high-pressure water.
- c. **Target holding** – Objects to be cleaned shall never be held manually.
- d. **Connection Protection** – The point where the hose connects to the gun shall be shrouded by a protective device, so as to prevent injury to operator should hose, pipe or fitting rupture. The protective shroud is provided by the manufacturer of the Shotgun / Hose and pressure tested to the same criteria as the hose.
- e. **Minimum Length** – Where practicable, the minimum length of the shotgun lance extension should be 4' from the triggering device to the nozzle.
- f. **Hose Protection** – Steel braided hoses should be used on air operated fail safe systems to keep the system from being activated by someone stepping on the hose or running over it.

6. Moling or Flex Lancing

- a. **Control** – The operator inserting the nozzle shall have direct control of the dump system.
- b. **Reversing** – A positive method shall be used to prevent the nozzle from reversing its direction inside the item being cleaned, such as using a pipe nipple behind the nozzle which has a length larger than the inside diameter of the item being cleaned. This pipe nipple is known as a "stinger".

Properly sized anti-reversal device (stinger assembly attached to a nozzle to prevent it from turning around inside a pipe or large tube)

shall be used throughout the task. The combined length of the hose connection, stinger, and nozzle shall be a minimum of 1.5 times the diameter of the pipe being cleaned unless the pipe being cleaned has a "T" then the combined length shall be 3 times the diameter of the largest pipe.

- c. **Retrojets** – During manual operations, the entrance to a line or pipe shall not be cleaned with a nozzle containing back water jets without adequate shielding.
- d. **Clearance** – The clearance between the outside diameter of the hose, lance, and nozzle assembly and the inside wall of the item being cleaned shall be sufficient to allow adequate washout of water and debris.
- e. **Pressurization** – During manual operation, the nozzle shall be inserted into the tube prior to pressurizing. Conversely, the system shall be depressurized before removal of the nozzle from the tube.
- f. **End Identification** – Hoses shall be conspicuously marked no closer than 24" from the nozzle to warn the operator of the nozzle location.
- g. **Nozzle support** – Where the length of the nozzle and rigid coupling is less than the inside diameter of the pipe, a length of rigid pipe (i.e., stinger) not less than the diameter of the pipe being cleaned should be fitted directly behind the nozzle or a suitable safety shield should be provided to protect the operator. This is to prevent the nozzle turning around 180 degrees and doubling back towards the operator.

7. Rigid Lancing

- a. **Control** - The operator inserting the nozzle shall have direct control of the dump system.
- b. **Clearance** - The clearance between the outside diameter of the lance and nozzle and the inside wall of the item being cleaned shall be sufficient to allow adequate washout of water and debris.
- c. **Pressurization** - When under manual operation, the nozzle shall be inserted into the tube prior to pressurizing. Conversely, the system shall be de-pressurized before removal of the nozzle from the tube, unless proper shielding is provided.

- d. **Shields** - When lancing tubes with a rigid lance, a guard should be installed, where practicable, around the lance, to prevent a lance nozzle from being inadvertently withdrawn and causing injury.
8. **Additives** – Any water additive (chemical, detergent, solid particle, etc.) shall be used in accordance to the manufacturer's recommendations.

9. Proper Operation

- a. **Start Up** – The high-pressure water jetting unit shall not be started and brought up to pressure unless each team member is in his designated position, the nozzle is held in, or directed at, the work piece and the lance / gun securely held.
- b. **Adjustments** – Apart from operational procedures, no attempt shall be made to adjust any nut, hose connection, fitting, etc., while the system is under pressure. The high-pressure water-jetting unit shall be stopped and any pressure in the line discharged prior to making any such adjustments.

Caution : Care should be taken to release the pressure in the dry shut off gun and the line when the unit is switched off.

- c. **Equipment Malfunction** – If for any reason the water flow does not shut off when the trigger or foot pedal is released, work shall cease until the item has been serviced, repaired or changed by properly trained personnel.
- d. **Reaction force** – The lance / gun operator should be allowed to experience the reaction force of the water jet progressively until the required operating pressure is reached. The lowest pressure should be used compatible with the work to be done. The pressure shall not be adjusted without the lance / gun operator's awareness.
- e. **Effect of Line Impulses** – Lance / gun operators should be made aware of the reactive effect of pressure in the line which can transmit a severe jolt to the operator when the dump valve or dry shut off valve is operated. To minimize this effect, total hose lengths should be kept as short as possible. Damping devices can be introduced into the system.
- f. **Thermoplastic Hoses** – Thermoplastic hoses should not be used for water jetting unless specifically designed for this purpose.
- g. **Operator Positioning** – The team members shall be safely positioned while operating the system and if any person should

encroach into the working area, high-pressure water jetting shall be stopped.

- h. **Work Stoppage** – Work shall stop when the following occurs :
- i. In the event that leaks or damage becomes apparent.
 - ii. If any person becomes aware of any change in conditions or any hazards are introduced.
 - iii. If plant or work alarms are sounded.
 - iv. If any of the recommended practices in this document are not followed.
- i. **Hose protection** – All hoses should be protected from being run over and crushed by vehicles, fork lifts, etc.
- j. **Back Thrust** – The back thrust from a linearly directed jet can be calculated from the following equation :

Back thrust (lb.) = $0.052 Q (P)^{0.5}$

Where “Q” is the flow rate in U.S. gallons per minute (gpm)

Where “P” is the jet pressure measured in psi.

Caution : It is not recommended that any (1) person be required to withstand a back thrust of more than 1/3 of their body weight for any extended period of time.

III.I. Use of Lances and Nozzles

1. **Lances** – Lances which are rigid or semi-rigid having nozzles fitted with any combination of forward, backward, or 90 degree angle jets shall be used with either a dump system or dry shut off control valve. When a flexible lance or nozzle mounted on a hose is in use, the jet should not be operated at pressure unless the nozzle is properly positioned inside the work piece, or the lance operator is protected by screens or proper shielding from rear facing jets. If necessary, the lead-in to the work piece should be cleaned by other methods.
2. **Flexible Lances** – Flexible lances used to clean pipes, where the inside diameter of the pipe is not small enough to prevent the lance from turning back on itself, shall have a piece of rigid straight tube, slightly longer than the diameter of the pipe, fitted immediately behind the nozzle to prevent this from happening.

3. **Distance Indicator** – When an assembly is used which allows the nozzle to enter the work piece with restricted visibility, the lance, hose, or floor should be clearly marked in a manner which enables the lance operator to judge how far the nozzle is in the work piece before pressure is applied and, conversely, so that pressure is released before the apparatus is completely withdrawn from the work piece.
4. **Anti-Withdrawal Device** – An Anti-Withdrawal Device shall be used for all lancing operations to prevent from the unintended discharge of the nozzle from the components being cleaned. If it is determined that the utilization of an Anti-Withdrawal Device is not feasible the J. J. White, Inc. HPWW Variance Form must be completed, which includes the proper notifications to both J. J. White, Inc. Management & the Owner.
5. **Lance length** – The length of a rigid lance or combination of lances shall be such that the lance operator can maintain control at all times.
6. **Jet pressure** – The nozzle and minimum operating pressure shall be selected by the lance operators to allow effective and efficient high-pressure water jetting.
7. **Improper Use** – Should a lance operator enter a manhole or access port for any purpose (preferably with the high-pressure water jetting unit turned off), the hose shall not be used to support his weight when climbing up or down. Additionally, under normal cleaning operations, the employee shall not utilize the lance above the shoulders or below the waist.
8. **"T" Pieces** – When using a "T" piece or nozzle carrier "T" (devices for producing (2) equal and opposite water jets at the end of the lance and at right angles to the normal flow), it should be inserted into a tube, a vessel, or between (2) surfaces before the system is pressurized. This is necessary to ensure that should (1) water jet be larger than the other, or (1) water jet become blocked or partially blocked, the operator of the lance will not be spun out of control. When a "T" piece is used to provide a balancing jet on a long lance to clean a single surface, it is not always possible to check for equal thrust from both jets in the manner described above, therefore these lances should be checked by progressive pressure increases. This restraint shall also apply to any form of multi-jet nozzle, the jets issuing from which having a radial component.
9. **Confined Working** – Before entry into a confined space for high-pressure water jetting, a certificate of clearance shall be obtained to ensure that access is safe.

III.J. Operational & Training Requirements

1. **Competent Person** - The Competent Person will be responsible for all aspects of the HPWW job. J. J. White, Inc. has outlined the requirements to be deemed the Competent Person on the job. The Competent Person shall not be the Site Superintendent or Safety Professional. The Competent Person shall be a full time J. J. White, Inc. employee; have (3) consecutive years of continuous employment with J. J. White, Inc., be knowledgeable in all the J. J. White, Inc. rules and the facility specific rules for J. J. White, Inc. where the job is running; and complete this training. Exceptions can only be granted by Jim White, Jim Daley, Robert Celestino or Joe Crowley. All above mentioned should be notified of any exception. This should be completed on a variance form.

The competent person on day shift will be : _____

The competent person on night shift will be : _____

2. **Qualified Operators** – Only trained personnel shall operate high-pressure water jetting equipment and supervise the training of new operators.
3. **Training** – The J.J. White, Inc. training program shall be presented to each employee before assignment to employee's first high-pressure cleaning or cutting job. Such training shall include, as a minimum, coverage of all items listed in these recommended practices.
4. **Cutting Action** – The cutting action of a high-pressure water jet and the potential hazard it poses to the human body shall be demonstrated through the use of audio/visual aids or actual use of equipment (i.e., by cutting through a piece of lumber, concrete block, etc.).
5. **Personal Protective Equipment** – The minimum personal protective equipment shall be explained. Instructions shall be given as to when and how specific clothing and other types of protective devices shall be worn according to the type of work performed, locations, etc.
6. **System operation** – The operation of the system shall be explained with potential problems pointed out and proper corrective action.
7. **Control Devices** – The operation of all control devices shall be explained. The importance of not tampering with any control devices as well as the importance of keeping them in proper working order shall be stressed.

8. **Equipment Maintenance** – It should be pointed out that valves and seating surfaces in pressure regulating devices encounter high wear during high-pressure water jetting. These items require frequent inspections, maintenance and / or replacements in order to provide operation.
9. **Hose** – The proper method of connecting hoses, including lying out without kinks, protection from excessive wear, and proper tools to use on couplings and fittings shall be explained.
10. **Stance** – The proper stance for sound footing and how to use the various devices for lancing, shot gunning and moling shall be demonstrated. The trainee, under close supervision, shall use the various devices while the unit is slowly pressurized.
11. **Proficiency** – Personnel shall demonstrate knowledge and skill in the proper operation of equipment through practical application.
12. **General** – System shall be depressurized when :
 - a. Not in use.
 - b. An unauthorized or inadequately protected person enters the barricaded area.
 - c. Replacement or repairs made to the system.
 - d. Any recommended practices are violated.
13. **Refresher training** - Operator retraining shall be on an annual basis or more frequently, if needed.

III.K. Permanent Cleaning Areas

1. **Enclosure** – The areas shall be suitably enclosed and warning notices prominently displayed at the access points and perimeters.
2. **Access** – Access by persons other than the high-pressure water jetting team shall be strictly prohibited while work is in progress. If any unauthorized entry is made, all work shall cease immediately.
3. **Hazards** – The working area shall be free from hazards likely to trip personnel, and be provided with adequate drainage and lighting fixtures.

III.L. Freeze Precautions

During the periods where there is a risk of freezing, follow the manufacturer's recommendations or take the following precautions on shutting down :

1. Remove gun or nozzle from delivery hose.
2. Pump water from supply tank until level of water is just above the filter.
3. Add recommended quantity of anti-freeze into water tank.
4. Place delivery hose into water tank and secure.
5. Run the pump until the anti-freeze works through the system.
6. Move selector lever to dump or recycle position until the anti-freeze shows in the water tank.
7. If no supply tank is fitted, follow manufacturer's recommendations.

WARNING : IF A HIGH-PRESSURE PUMP OR HOSE APPEARS FROZEN, ON NO ACCOUNT MUST THE PUMP BE ENGAGED OR THE ENGINE STARTED IF THERE IS DIRECT DRIVE TO THE PUMP UNTIL THE SYSTEM HAS BEEN THAWED OUT AND LOW PRESSURE WATER HAS BEEN ALLOWED TO FLOW THROUGH THE SYSTEM TO THE NOZZLE END OF THE LANCE (THE LANCE HAVING BEEN REMOVED).

III.M. Accidents

1. **Personal Injuries** – In the event that a person is injured by the impact of a high-pressure water jet, the injury caused may appear insignificant and give little indication of the extent of the injury beneath the skin and damage to deeper tissues. Large quantities of water may have punctured the skin, flesh and organs through a very small hole that may not even bleed.
2. **Operator Identification** – Immediate hospital attention is required and medical staff must be informed of the cause of the injury. To ensure that this is not overlooked, all lance / gun operators engaged in high-pressure water jetting should carry an immediately accessible waterproof card which outlines the possible nature of the injury and titled with the following text :

“IMPORTANT MEDICAL INFORMATION!”

3. **Immediate First Aid** – Where medical examination is not immediately possible in remote situations, first aid measures should be confined to dressing the wound and observing the patient closely until a medical examination has been arranged.

4. **Reporting** – If the water jet accidentally strikes any person or equipment, this fact must be immediately reported to all of the following: Site Superintendent, the HPWW Competent Person and Robert Celestino **IMMEDIATELY!**

III.N. Responsibility

1. **Purpose** – These recommended practices are provided to assist persons unfamiliar with the operation of high-pressure water jetting equipment.
2. **Responsibility** – The responsibility of correct operation and use of the equipment is the sole responsibility of the operator. The operator should familiarize himself with the identification of high-pressure water jetting fittings, hoses, lance / guns, and accessories. Modification of high-pressure water jetting equipment or accessories is prohibited without prior written approval from J.J. White, Inc. Corporate Safety Coordinator.
3. Serious harm or injury may result from the misuse of high-pressure water jetting equipment, the use of improper fittings, hoses or improper attachments.

High Hazard JSA for High Pressure Water Cleaning Appendix 1

Foreman _____

Foreman Signature _____

Competent Person _____

Shift _____ Date _____

Location _____

Task: (Shot gun, Lance, or Moling) _____

Equipment Being Serviced: _____

Revalidation Time / Date: _____

Revalidation New Hazards: _____

General

1. Is the area, including the other end of the unit being serviced, cleaned, roped off, and proper safety signs posted?

(Yes / No) _____

2. Have precautions been taken to protect electrical equipment from water?

(Yes / No) _____

3. Is there any hazard to personnel from possible damage to equipment such as release of corrosive chemicals, flammable liquids, gases, etc.?

(Yes / No) _____

4. Are all pumps, hoses, and temporary lighting staged out of the way to reduce tripping hazards and congestion?

(Yes / No) _____

5. Are all fittings of the correct pressure rating?

(Yes / No) _____

6. Are all hoses of the correct pressure rating?

(Yes / No) _____

7. Are all hoses in good operating condition?
(Yes / No) _____
8. Are all fittings in good operating condition?
(Yes / No) _____
9. Is the filter on the pump suction clean and in good operating condition?
(Yes / No) _____
10. Is there a minimum 20psi fresh, clean water supply at the pump suction?
(Yes / No) _____
11. Have precautions been taken against freezing?
(Yes / No) _____
12. Do all personnel have the proper safety equipment for this job?
(Yes / No) _____
13. Do all personnel have the proper safety training for this job?
(Yes / No) _____
14. Are all personnel qualified to perform this work?
(Yes / No) _____
15. Are explosive or flammable vapors possible and are monitoring provisions established?
(Yes / No) _____
16. Is there any danger from the waste water or from the reaction of the scale and water?
(Yes / No) _____
17. Has complete hook-up been finished prior to installing nozzles?
(Yes / No) _____
18. Has hook-up, including pipes, hoses, and connections been pressure tested with water at maximum operating pressure?
(Yes / No) _____

19. Is dump system operating properly; will it dump when released?

(Yes / No) _____

20. Are safety systems operational?

(Yes / No) _____

21. Have all crew members been HPWW trained in the preceding 12 months or less?

(Yes / No) _____

22. Is the front line operator donning the turtle suit and in control of the foot pedal / trigger?

(Yes / No) _____

23. Have any variances been preapproved on the variance form and explained to you?

(Yes / No) _____

24. Are all pressure relief valves operating properly?

(Yes / No) _____

Lancing

1. Is an anti-withdrawal device available for lancing? If the anti-withdrawal cannot be used, has the variance form been completed?

(Yes / No) _____

2. Is the work area at a comfortable level, not higher than shoulders or lower than the waist?

(Yes / No) _____

3. Are all nozzles free from plugging and in good operating condition?

(Yes / No) _____

Moling

1. Is an anti-withdrawal device available for moling? If the anti-withdraw device cannot be used, has the variance form been completed?

(Yes / No) _____

2. Are all nozzles free from plugging and in good working condition?

(Yes / No) _____

3. Have precautions been taken to prevent line mole reversal?
(Yes / No) _____

Shotgun

1. Does the tail whip on the shotgun have the protective shroud?
(Yes / No) _____

2. Is there adequate manpower to rotate personnel and prevent fatigue?
(Yes / No) _____

3. Does the operator have the required metatarsal and steel toe foot protection if
a turtle suit waiver has been issued?
(Yes / No) _____

Does the tail whip on the shotgun have a protective shroud
(Yes / No) _____

**ALL EMPLOYEES HAVE THE AUTHORITY TO STOP WORK AT ANY TIME –
IF THE ANSWER TO ANY OF THE ABOVE QUESTIONS IS “NO”, THEN
STOP WORK IMMEDIATELY!**

Crew Member's Name :

Crew Member's Signature :

Exchanger Group Variance Form

Appendix 2

SCOPE: The utilization of a handheld water wash device commonly referred to as “a walking lance” may not be used with pumps capable of producing pressures in excess of 10,000 PSI, without the approval of the Corporate Safety Director, Exchanger Group Vice President, and the Site Manager.

Specifically, the use of 40,000 PSI high pressure cleaning is limited to those applications where it is absolutely essential.

The use of an Anti-Withdrawal Device is required for lancing operations. In the event that a certain configuration prevents the operator from using this device, prior approval is required from the Corporate Safety Director, Exchanger Group Vice President, the Site Manager and the Owners Representative.

Date : _____

Date of Commencement : _____

Variance Requestor : _____

Equipment to be Cleaned : _____

Reason for Variance : _____

{Have all other methods of cleaning / water blasting been considered? (Y / N) }

Crew Member's Name :

| | |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Required Signatures :

Corporate Safety : _____

V.P. Exchanger Group : _____

Risk Manager : _____

Site Manager / Superintendent :

_____ ** Any variance granted for

P.P.E. or work methods shall only be conducted under the continual direct supervision of the Competent Person **

Medical Alert Card

Appendix 3

| WARNING! | IMPORTANT MEDICAL INFORMATION |
|--|--|
| <p>An injury caused by high pressure waterjets can be serious. In the event of any waterjet injury:</p> <ul style="list-style-type: none">• Seek medical attention immediately. Do not delay!• Inform the doctor of the cause of the injury.• Show the doctor this card.• Tell the physician what type of waterjet project was being performed at the time of the accident and the source of the water. | <p>READ THIS PLASTIC CARD AND KEEP IT IN YOUR WALLET. IN THE EVENT OF A WATERJET INJURY, SHOW THE CARD TO YOUR DOCTOR.</p> <hr/> <p>Trained in High Pressure Water Technology by: J.J. WHITE INC. 5500 BINGHAM STREET PHILADELPHIA, PA phone: (215) 722-1000 fax: (215) 745-6229 website: www.jjwhiteinc.com</p> |

| MEDICAL ALERT NOTE PHYSICIAN |
|---|
| <p>This patient may be suffering from a waterjet injury. Evaluation and management should parallel that of a gunshot injury. The external manifestations of the injury cannot be used to predict the extent of internal damage. Initial management should include stabilization and a thorough neurovascular examination. X-rays can be used to assess subcutaneous air and foreign bodies distant from the site of injury. Injuries to the extremities can involve extensive nerve, muscle, vessel damage, as well as cause a distal compartment syndrome. Injuries to the torso can involve internal organ damage. Surgical consultation should be obtained. Aggressive irrigation and debridement is recommended. Surgical decompression and exploration may also be necessary. Angiographic studies are recommended pre-operatively if arterial injury is suspected. Bandages with a hygroscopic solution (MgSo₄) and hyperbaric oxygen treatment have been used as adjunctive therapy to decrease pain, edema and subcutaneous emphysema. Unusual infections with uncommon organisms in immunocompetent patients have been seen; the source of the water is important in deciding on initial, empiric antibiotic treatment, and broad-spectrum intravenous antibiotics should be administered. Cultures should be obtained.</p> |

Danger HPWW Sign

Appendix 4

**** REFER TO NEXT PAGE ****

DANGER

**HIGH PRESSURE
WATER WASH AREA**

(AUTHORIZED EMPLOYEES ONLY)

Pre-Service Safety Checklist

Appendix 5

Date _____

Location _____

Equipment Being Serviced: _____

Competent Person _____

Competent Person Signature _____

1. Is the area – including the other end of the unit being serviced – cleaned, roped off, and proper safety signs posted?

(Yes / No) _____

2. Have precautions been taken to protect electrical equipment from water?

(Yes / No) _____

3. Is there any hazard to personnel from possible damage to equipment such as release of corrosive chemicals, flammable liquids, gases, etc.?

(Yes / No) _____

4. Are all pumps, hoses, and temporary lighting staged out of the way to reduce tripping hazards and congestion?

(Yes / No) _____

5. Are all fittings of the correct pressure rating?

(Yes / No) _____

6. Are all hoses of the correct pressure rating?

(Yes / No) _____

7. Are protective shrouds required and are they the correct pressure rating?

(Yes / No) _____

8. Are all hoses in good operating condition?

(Yes / No) _____

9. Are all fittings in good operating condition?

(Yes / No) _____

10. Is an anti-withdrawal device available for lancing? If the anti-withdrawal device cannot be used, has the variance form been completed?

(Yes / No) _____

11. Are all nozzles free from plugging and in good operating condition?

(Yes / No) _____

12. Have precautions been taken to prevent line mole reversal?

(Yes / No) _____

13. Is the filter on the pump suction clean and in good operating condition?

(Yes / No) _____

14. Is there a minimum of 20psi fresh, clean water supply at the pump?

(Yes / No) _____

15. Have precautions been taken against freezing?

(Yes / No) _____

16. Do all personnel have the proper safety equipment for this job?

(Yes / No) _____

17. Do all personnel have the proper safety training for this job?

(Yes / No) _____

18. Are explosive or flammable vapors possible and are monitoring provisions established?

(Yes / No) _____

19. Is there any danger from the waste water or from the reaction of the scale and water?

(Yes / No) _____

20. Has complete hook-up been finished prior to installing nozzles?

(Yes / No) _____

21. Is the dump system operating properly? Will it dump when released?

(Yes / No) _____

22. Are safety systems operational?

(Yes / No) _____

23. Are all pressure relief valves operating properly?

(Yes / No) _____

24. Has the oil pump been checked for proper fill level?

(Yes / No) _____

Important Recommended Safety Procedures

Appendix 6

As with all power tools, the national liquid blaster hydroblasting equipment must be used in accordance with specified safety procedures and common safety sense. To aid in insuring that this equipment is operated with a maximum amount of safety, we have prepared the following list of recommendations. This list is not intended to be all inclusive, and additional safety precautions should be followed as they are dictated by the application, plant safety procedures, and particular working conditions.

1. Safety equipment to be worn by operators :

- a. Turtle Suit
- b. Goggles or safety glasses **AND** wrap around face shield
- c. Hard helmet with ear protection
- d. Steel-toed shoes
- e. Rain gear and gloves

**** Note : Rain-X or other water repellent may be used for face shields ****

- 2. The lance must always be pointed directly at the work area.
- 3. The operator must maintain good footing.
- 4. Non-operators must remain a safe distance from the operator. The distance should be a minimum of 25'.
- 5. Non-operators should never approach the operator without first gaining the attention of the operator.

6. The operating pressure should never exceed that which is necessary to accomplish the job.
7. No unauthorized attachments or modifications should be made to the unit, the cleaning gun, or the accessories.
8. Operators should be changed on frequent intervals to avoid fatigue.
9. Operators and all persons within the operating area should not engage in horseplay. This will result in immediate termination!
10. Equipment should be properly maintained as outlined in the maintenance manual.
11. All operators should be properly trained according to J. J. White, Inc.'s high-pressure water wash program requirements.
12. Equipment should be cleaned often to prevent dirt and other build-ups.

Misc. Tables

Appendix 7

| Operating Pressures By Task | | |
|------------------------------------|-----------------------------|--------------------------|
| TASK | OPERATING RANGE(Psi) | CRAFT |
| Shot Gun | 1,000 psi - 40,000 psi | BOILERMAKERS/PIPEFITTERS |
| Lancing (Solid) | 1,000 psi - 40,000 psi | BOILERMAKERS |
| Lancing (Flex) | 1,000 psi - 20,000 psi | BOILERMAKERS |
| Moling | 1,000 psi - 20,000 psi | BOILERMAKERS/PIPEFITTERS |
| Cutting | 20,000 psi - 36,000 psi | OPERATING ENGINEERS |

| Stationary Equipment by Craft | |
|--|--------------|
| EQUIPMENT | CRAFT |
| Air-Driven, Hands-Free, Flex Lance Machine | BOILERMAKERS |
| Air-Driven, Hands-Free, Non-Flex, Beam Lance Machine | BOILERMAKERS |
| Cab-Over Hydraulic Machine | BOILERMAKERS |
| Shell Side Hydraulic Machine | BOILERMAKERS |

HPWW Hands-On Training & Acknowledgement

Appendix 8

Date _____ Job Number _____

Instructor Name _____

Instructor will initial next to each item that is covered during the hands-on and visual portions of High-Pressure Water Equipment Hands-On Training. Training is valid for 1-year from date.

Stationary Equipment

Shell Side Hydraulic Machine

Exterior Rig

- _____ Ignition Key On/Off
- _____ Bundle Roller Clockwise Lever
- _____ Bundle Roller Counter-Clockwise Lever

Moveable Control Box

- _____ Traveler Advance / Return
- _____ Tilt
- _____ Water On/Off
- _____ Boom Up/Down
- _____ Boom In/Out

Cab-Over / IBC Machine

Left Side of Cab Chair

- _____ Pipe Frame In/Out Control Knob
- _____ Lance In/Out Control Knob
- _____ Hydraulic Pressure Gauge

- _____ Lance In Speed Control Dial
- _____ Lance Out Speed Control Dial

Right Side of Cab Chair

- _____ Cab Up/Down Control Knob
- _____ Bundle Rotator Control Knob
- _____ Frame Left/Right Control Knob
- _____ Front Windshield Wiper Switch

- _____ Ignition Key On/Off
- _____ Front Light Switch
- _____ Water Pressure On/Off

Exterior Rig

- _____ Emergency Stop Slap Button

Behind Cab Chair

- _____ Left Pressure Valve _____ Right Pressure Valve _____ Up Pressure Valve
- _____ Down Pressure Valve

Air-Driven Hands Free Flex and/or Rigid Lance

- _____ Rotator 40K Lance Valve
- _____ Air Feed Knob for 40K Rotate Lance
- _____ Tube Lance Equip. Up/Down Control Knob
- _____ Tube Lance Equip. Left/Right Control Knob
- _____ Lance Forward/Reverse Control Knob

- _____ Black Cap Lubricant Inlet
- _____ Friction Pressure Gauge
- _____ Friction Pressure Adjust. Dial
- _____ Forward Speed Control Dial
- _____ Reverse Speed Control Dial
- _____ Safety Latch

Hand Held Equipment

Shotgunning

- ___ Shot gun
- ___ Hose with Shroud
- ___ Whip Check
- ___ Safety Latch
- ___ Engage Trigger / Adjust Pressure

(Hand) Flex Lancing

- ___ Foot Pedal
- ___ Whip Check Exit Side of Pedal
- ___ Hose
- ___ Anti-Withdrawal Device
- ___ Stinger
- ___ Nozzle

Moling

- | | |
|---|-----------------------------------|
| ___ Whip Check Feed Side of Pedal | ___ Nozzle Head |
| ___ Whip Check Exit Side of Pedal | ___ Foot Pedal |
| ___ Hose marked with 5 foot indicator | ___ Whip Check Feed Side of Pedal |
| ___ Stinger (when cleaning pipe of 8" or greater) | |
| ___ Back-Out Preventer Affixed to Pipe Opening | |

Personal Protective Equipment

- | | | |
|---|--------------------|------------------------|
| ___ Hard Hat | ___ Eye Protection | ___ Gloves |
| ___ Face Shield | ___ Turtle Suit | ___ Hearing Protection |
| ___ Wet Suit | ___ Chemical Suit | |
| ___ Waterproof Boots w/ Metatarsal Guards | | |

Site Specific Wash Pad Orientation

- | | |
|--|----------------------------|
| ___ Bundle Rotation Equipment | ___ Lighting |
| ___ Hose Ramps / Protection | ___ Wash Area |
| ___ Blast Shield Locations | ___ Pump Locations |
| ___ Safe Radius Signs & Perimeter Barricades | ___ Egress / Access Routes |

Signature acknowledges receipt of visual and hands-on training with the high-pressure water equipment initialed by the instructor above and site specific wash pad orientation.

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

Name _____ Signature _____

APPENDIX 22

TANK GROUP SAFETY CHECK LIST



TANK GROUP SUPERVISOR SAFETY CHECKLIST

| SHELL AND BOTTOM | YES | NO | N/A |
|---|-----|----|-----|
| 1. All repads including half pad mods and keyhole mods must have weep holes | | | |
| 2. Bypass piping apart and plugged, lockout/tagout procedures in place for terminal or J.J. White, Inc. | | | |
| 3. All valves isolated, blank or blinded | | | |
| 4. Check for LEL's in the tank before entering, monitor calibration recent and tagged on monitor | | | |
| 5. If any Hot Work is to be done on the bottom drill and check for LEL's under the bottom. | | | |

| PIPING | YES | NO | N/A |
|---|-----|----|-----|
| 1. All external piping is to be blanked or blinded if attached to tank valve or nozzle | | | |
| 2. Check for LEL's inside of the jet nozzles | | | |
| 3. If piping runs downhill towards the shell make sure outside of the nozzle is open. If it is not, unbolt the pipe or drill a hole with air drill inside and check for LEL | | | |
| 4. Floating suction pontoons, remove the plugs if there are none drill top of the pontoon and check for LELs | | | |
| 5. Stands made of pipe should have a weep hole near the bottom, if not drill a hole with air drill | | | |
| 6. Check fill lines and suction lines for product | | | |

| FLOATER | YES | NO | N/A |
|---|-----|----|-----|
| 1. Remove move plugs in aluminum floater pontoons and check for LELs if there are no plugs drill with air drill and check | | | |
| 2. Check all floater legs for weep holes near the bottom. If none, drill with air drill. | | | |
| 3. Remove any aluminum float gauges from the tank before any hot work | | | |
| 4. Check behind the seal for LELs | | | |
| 5. If there is a foam log seal in the tank report it to your Project Manager and site contact before any work starts | | | |
| 6. Remove hatches from steel pontoons and check for LELs | | | |
| 7. Install anti-rotation on floater to secure in place before jacking | | | |

| INSIDE OF DIKE WALL | YES | NO | N/A |
|--|-----|----|-----|
| 1. Check for any sewer drains inside the dike wall. If any, cover with fire blanket. | | | |
| 2. Have plenty of charged and currently tagged fire extinguishers on site and nearby before any hot work starts. | | | |

Job

Signature _____

Date: _____

APPENDIX 23

TANK GROUP ROOF TIE OFF SYSTEM INFO



Hagen Engineering International, Inc.

For:

JJ White, Inc.

Calculations and Details for Roof Tie-Off System

Calcs performed by: Doug Bayles, P.E.

Date: 11-20-2012

[Handwritten signature: Doug Bayles]
[Circular professional seal: Doug Bayles, P.E., State of Oklahoma, No. 112012]
[Handwritten: 11/20/12]
[Handwritten: 1 of 14]

By: DJB
RFE No: N/A
Rev No: 0
Rev Date: 11/19/12

Supplemental Design Calculation for Lifeline / Lanyard Support System:

Design Criteria: **1926.502 (b)-(e) Fall Protection Systems Criteria and Practices**

Maximum Arresting Force
when use with body harness
(ref. OSHA):

$$P := 1800\text{lb}$$

Min. Specified Yield Strength of
Carbon Steel (**Catalog**):

$$F_y := 36\text{ksi}$$

Breaking Strength of 3/8" Galv.
Wire Rope (ref. **Handbook for
Riggers-89**):

$$BS := \left(\frac{3}{8}\right)^2 \cdot (42\text{ton}) = 11812.5\text{lb}$$

Min. Roof Plate(ref **API**):

$$t_p := 0.1875\text{in}$$

Min. Shell Plate(Preferred):

$$t_s := 0.25\text{in}$$

Estimated Available Safety
Factor of Wire Rope Breaking
Strength as per **Handbook
for Riggers**:

$$SF := 5$$

Fillet Weld Tensile Strength 7018 for
SS304 (ref. **AWS D1.6**):

$$F_u := 70\text{ksi}$$

Min. Fillet Weld For $T < 3/4"$
(ref. **AWS D.1.1**):

$$t_{\min} := \frac{1}{4}\text{in}$$

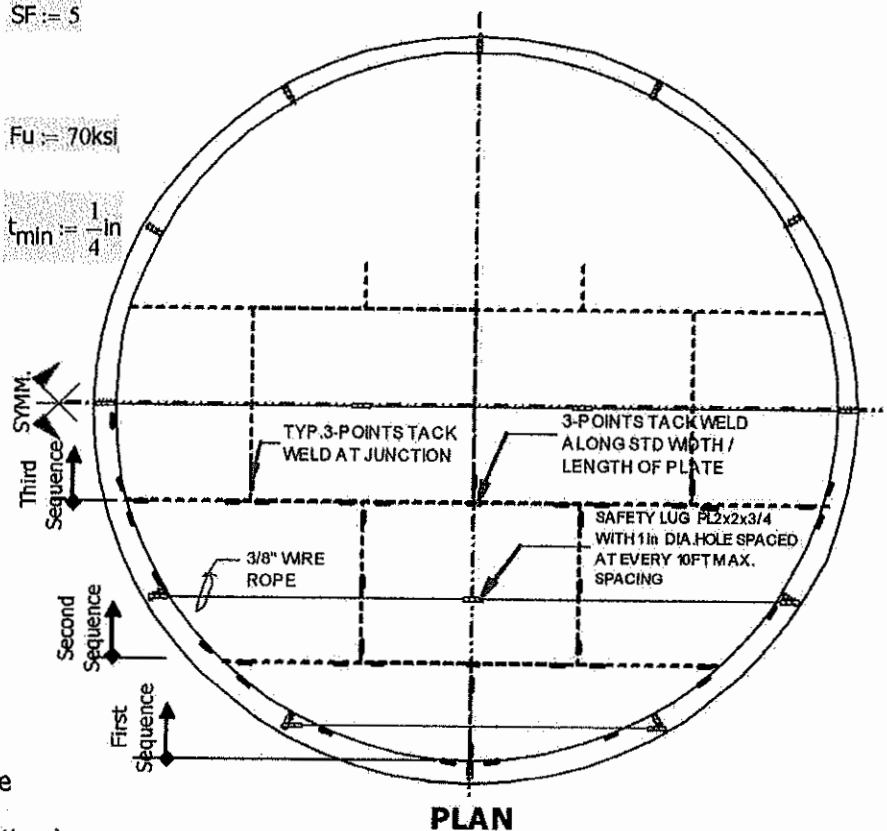
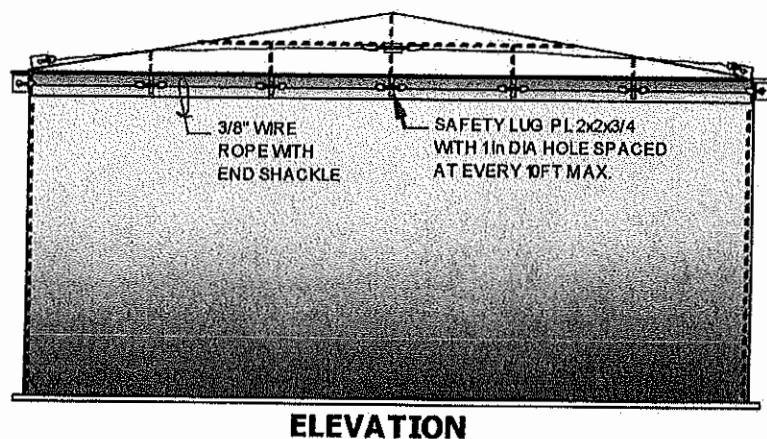
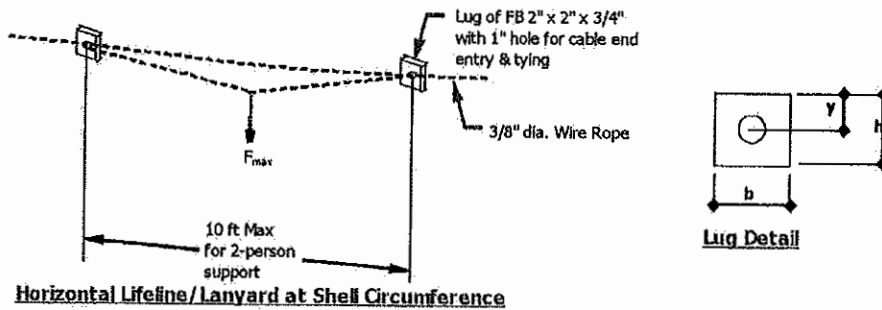


Figure 1: 2-Employee Lifeline Layout for the
Installation of Tank Conical Roof
(See calculations for the lifeline ratings)

Note: Sizes of materials suggested to be
use in this activity for safety system
shall serve as minimum requirements
for a specific above mentioned
loading condition.



1.0 Analysis & design of Lifeline system along the shell circumference for 2-employee per lanyard:



1.1 Check Wire Rope Breaking Capacity for 2-employee per lanyard:

Preferred Lug Maximum Spacing: $\text{Span} := 10\text{ft}$

Cable Design Maximum Vertical Sag prior to breaking : $\text{Sag} := 24\text{in}$

Maximum Applied Force for 2-employee, F_{max} including impact: $F_{\text{max}} := 2P = 3600 \cdot \text{lb}$

Estimated Tension Force (T1) at Wire Rope including impact: $T1 := \left(\frac{F_{\text{max}}}{2 \sin \left(\tan \left(\frac{\text{Sag}}{0.5 \text{Span}} \right) \right)} \right) = 4386.93 \cdot \text{lb}$

Safe Working Strength of 3/8" dia. Wire Rope: $T1_{\text{allow}} := \text{BS} = 11812.5 \cdot \text{lb}$

Actual Available Safety Factor of Wire Rope: $\text{SF1} := \text{SF} - (T1 \div T1_{\text{allow}}) = 4.63$

$\text{if}(\text{SF1} \geq 1.0, \text{"Wire Rope is Safe"}, \text{"Wire Rope is Unsafe"}) = \text{"Wire Rope is Safe"}$

1.2 Check Lug Capacity from Tearing at hole:

Lug Size & thickness (PL 3"x3"x3/4"):

| | | | | |
|--------------------------|--------------------------|------------------------------------|--------------------------|------------------------------------|
| $b := 2 \cdot \text{in}$ | $h := 2 \cdot \text{in}$ | $t := \frac{3}{4} \cdot \text{in}$ | $y := 1 \cdot \text{in}$ | $\text{hole} := 1 \cdot \text{in}$ |
|--------------------------|--------------------------|------------------------------------|--------------------------|------------------------------------|

Net Shear Area at hole: $A1 := (0.5b - 0.5\text{hole}) \cdot t = 0.375 \cdot \text{in}^2$

Conservatively Calculating the resultant of the Rope Tension to be the Tearing Force at pin hole : $F1 := T1 \cdot \left(\cos \left(\tan \left(\frac{\text{Sag}}{0.5 \text{Span}} \right) \right) \right) = 4000.65 \cdot \text{lb}$

Allowable Shear Force at Plate Net Shear Section Area: $F1_{\text{allow}} := 0.4 \cdot F_y \cdot A1 = 5400 \cdot \text{lb}$

Actual Available Safety Factor of Lug: $\text{SF2} := (F1_{\text{allow}} \div F1) = 1.35$

$\text{if}(\text{SF2} \geq 1.0, \text{"Lug is Safe"}, \text{"Lug is Unsafe"}) = \text{"Lug is Safe"}$

1.3 Check Weld Capacity at Lug from Pulling Force at the hole:

Actual Diagonal Shear Force at Weld: $F2 := T1 = 4386.934 \cdot \text{lb}$

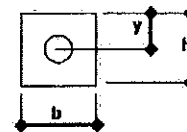
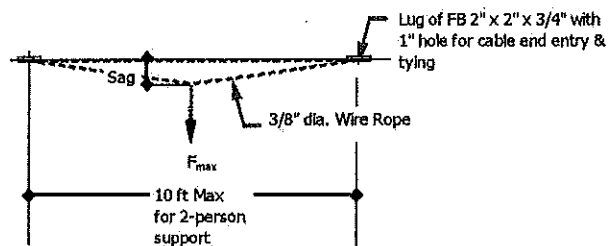
Fillet Weld Length & Thickness at Lug: $L1 := b = 2 \cdot \text{in}$ $t_{\text{min}} = \frac{1}{4} \cdot \text{in}$

Allowable Shear Strength at Weld: $F2_{\text{allow}} := 0.707 \cdot t_{\text{min}} \cdot L1 \cdot (0.3 \cdot F_u) = 7423.5 \cdot \text{lb}$

Actual Available Safety Factor of Weld: $\text{SF3} := (F2_{\text{allow}} \div F2) = 1.86$

$\text{if}(\text{SF3} \geq 1.0, \text{"Weld is Safe"}, \text{"Weld is Unsafe"}) = \text{"Weld is Safe"}$

2.0 Analysis & design of Lifeline system over the Tank Roof with 2-employee working:



Lug Detail

Plan View of Horizontal Lifeline/Lanyard over the tank roof

2.1 Check Wire Rope Breaking Capacity for 2-employee per lanyard:

Preferred Lug Maximum Spacing: $\text{Span} := 10\text{ft}$

Cable Design Maximum Vertical Sag prior to Breaking: $\text{Sag} := 24\text{in}$

Maximum Applied Force for 2-employee, F_{max} including impact: $F_{\text{max}} := 2P = 3600\text{lb}$

Estimated Tension Force (T_2) at Wire Rope including impact:

$$T_2 := \left(\frac{F_{\text{max}}}{2 \sin \left(\tan \left(\frac{\text{Sag}}{0.5 \text{Span}} \right) \right)} \right) = 4386.93\text{lb}$$

Safe Working Strength of 3/8" dia. Wire Rope:

$$T_{2\text{allow}} := BS = 11812.5\text{lb}$$

Actual Available Safety Factor of Wire Rope:

$$SF_4 := SF - (T_2 + T_{2\text{allow}}) = 4.63$$

$\text{If}(SF_4 \geq 1.0, \text{"Wire Rope is Safe"}, \text{"Wire Rope is Unsafe"}) = \text{"Wire Rope is Safe"}$

2.2 Check Lug Capacity from Tearing at hole:

Lug Size & thickness (PL 2"x2"x3/4"):

$$b_w := 2\text{in}$$

$$h_w := 2\text{in}$$

$$t_w := \frac{3}{4}\text{in}$$

$$y_w := 1\text{in}$$

$$\text{hole}_w := 1\text{in}$$

Net Shear Area at hole: $A_2 := (0.5 \cdot b - 0.5 \text{hole}) \cdot t = 0.375\text{in}^2$

Since Lug is installed along the rope, tearing force therefore is conservatively taken directly equal to the rope tension:

$$F_3 := T_2 = 4386.93\text{lb}$$

Allowable Shear Force at Plate Net Shear Section Area:

$$F_{3\text{allow}} := 0.4 \cdot F_y \cdot A_2 = 5400\text{lb}$$

Actual Available Safety Factor of Lug:

$$SF_5 := (F_{3\text{allow}} + F_3) = 1.23$$

$\text{If}(SF_5 \geq 1.0, \text{"Lug is Safe"}, \text{"Lug is Unsafe"}) = \text{"Lug is Safe"}$

2.3 Check Weld Capacity at Lug from Pulling Force at the hole:

Actual Diagonal Shear Force at Weld:

$$F_4 := T_2 = 4386.93\text{lb}$$

Fillet Weld Length & Thickness:

$$L_2 := b = 2\text{in}$$

$$t_{\text{min}} = \frac{1}{4}\text{in}$$

Allowable Shear Strength at Weld:

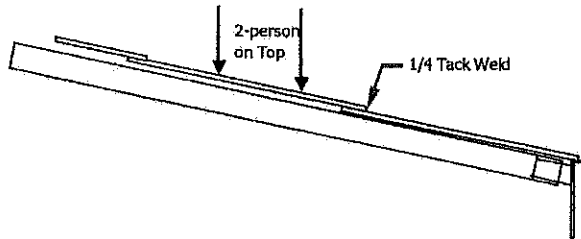
$$F_{4\text{allow}} := 0.707 \cdot t_{\text{min}} \cdot L_2 \cdot (0.3 \cdot F_u) = 7423.5\text{lb}$$

Actual Available Safety Factor of Weld:

$$SF_6 := (F_{4\text{allow}} + F_4) = 1.69$$

$\text{If}(SF_6 \geq 1.0, \text{"Weld is Safe"}, \text{"Weld is Unsafe"}) = \text{"Weld is Safe"}$

3.0 Analysis for Setting-up the Roof Plates with 2-employee working:



Section View of Setting-up Roof Plate with 2-employee on top

3.1 Determine the required tacking points for setting-up the roof plates with 2- employee working directly over the top:

Intended Design Tacking Points per Roof Plate: $N_{\text{provided}} := 6$

Sliding Friction Factor Between Steel to Steel: $\mu := 0.4$

Imposed Gravity Load at roof plate for two person working: $P_T := 2 \cdot P = 3600 \cdot \text{lb}$

Sliding Load that may cause sliding of roof plates when the two person working directly on top of roof plate : $F_5 := \mu \cdot P_T = 1440 \cdot \text{lb}$

Tack Weld Thickness: $t_{\text{min}} = \frac{1}{4} \cdot \text{in}$

Allowable Strength of Tack Weld per unit length: $F_{5\text{allow}} := 0.707 \cdot t_{\text{min}} \cdot (0.3 \cdot F_u) = 3711.75 \cdot \frac{\text{lb}}{\text{in}}$

Required Nos of Tacking Points for per plate with two person working on top: $N_{\text{reqd}} := (F_{5\text{allow}} + F_5) \cdot (\text{in}) = 3$

Actual Available Safety Factor of 6-tacking points: $SF_7 := \left(\frac{N_{\text{provided}}}{N_{\text{reqd}}} \right) = 2$

$\text{if}(SF_7 \geq 1.0, \text{"Tack Weld is Safe"}, \text{"Tack Weld is Unsafe"}) = \text{"Tack Weld is Safe"}$

Safety Department

Scope: Installing Flat Bottom Tank, External Cone Roof.

Safe Work Procedure

1. Preparation for transferring the inside tank scaffold to the outside can begin when the round seam and verts on the last ring of shell plate are being welded.
 - 1.1 The foreman will assign a welder(s) to install scaffold bracket lugs on the outside of the last ring of shell plate.
 - 1.2 The welder(s) must initial each bracket lug per safe work procedure.
 - 1.3 The welder will position himself to the outside of the shell by use of hook ladder or vert cage.
 - 1.4 The rolling tie off block will serve as the anchorage point for the welder's personal fall protection system which consists of a full body harness and lanyard.
2. After the top ring is welded and cleaned up, the inside scaffold will be raised within Approximately 4 ' from the top of the tank shell or jumped to the outside of the tank at this time. It is physically more difficult to transfer the scaffold to the outside from the next to last ring when 10 ' plate is being used. This is about a 14 ' distance. Continue the erection ladder up to the top of the shell since this ladder will be used to access the outer scaffold after the inner scaffold is transferred to the outside of the tank shell.

Note: If the scaffold is raised with a plank jig system and crane, rather than manually, it may be transferred to the outside of the tank shell from below the last round seam.

- 2.1 Layout and place marks on the shell for the rafter stools at this time.
- 2.2 Place scaffold brackets on the outer shell bracket lugs and transfer the tank scaffold to the outside of the tank.
- 2.3 Work in progress from the outside scaffold, at this time will be fitting and welding the tank top angle. Also, as soon as the top angle is fit the rafter stools can be fit and welded.
- 2.4 Depending on the tank diameter, there may be one center column or multiple columns and supporting roof structure.
- 2.5 If the rafters are not too long, bolt up two rafters to a column. Rig a sling at the column top and one sling on each rafter. The object here is to take load strain off the bolt plate at the top of the column and rafters so no bending or distortion occurs. Rig the lift, to hang as near vertical, as possible. Stand the column with the rafters protruding out over the shell top angle. Work the bottom of the column into proper position and the rafter ends to their shell stools and bolt up.

Note: On exceptionally long rafters, it may be necessary to use the crane to stand the column in position without any rafters attached. Guy off the column with 3/8" wire rope evenly spaced from the column

to the tank bottom at 120° apart. Two men at the shell stools and one from an aerial lift at the column can bolt up, as the crane brings rafters into position.

- 2.6 The preferred method with regard to safety for bolting rafters at columns is utilizing an aerial lift inside the tank.

Note: When it is not possible to use an aerial lift for the above task because of an internal floating roof or no door sheet, an employee may coon a fit rafter to reach the top of a column. This may be done only after rigging a 7/16 " wire rope sling around an existing roof rafter and placing the eyes of the sling in a 3/4 " shackle. The employee's lanyard will run from mid-back D ring to the sling. The sling tieoff will slide along easily. Only self locking lanyard snaphooks may be used with personal fall protection systems.

Note: If an employee does coon rafters to reach the tops of columns, a fall hazard will exist in which the employee cannot rescue himself in the event he falls from the rafter. Because of this fact, a work basket must be on-site to perform a rescue by using the crane in conjunction with the work basket.

Note: The regional or division office must have the work basket drawing and design calculations with an engineer's stamp, on hand.

3. With a complete tank scaffold on the outside of the tank shell, setting and fitting perimeter (sketch) roof sheets can begin.
- 3.1 A complete tank scaffold consists of a mid and top, 3/8 " handline, tightly strung through each safety post for the complete circumference of the tank.
- 3.2 Two cable clamps must be used to connect the ends of each handline.
- 3.3 Scaffold handline cannot be used as a tieoff point for employee lanyards.
- 3.4 Weld lead, air hose, extension cords or tag lines must not be tied off to scaffold handline.
- 3.5 Chainbinder tie-downs will be used on the ends of each scaffold bay at the plank overlap. The three plank walking/working surface of the scaffold must overlap one foot at the ends of each scaffold bay.
4. When the installation of the roof structure is complete, set the roof perimeter (sketch) sheets first. Personnel will work off the outer tank scaffold, as perimeter roof plates are set into position.
- 4.1 There may be times when the tank diameter is so large that the crane must setup one or more times to reach laydown points.

Note: Site conditions may make it necessary to lift all roof plate from one position. In this scenario, the Project Manager must workout an alternative plan with the Safety Department to maneuver the roof sheets into proper position. An example of an acceptable alternative may be using an airplane buggy from a landing point on the tank roof.

- 4.2 Mark proper lap distance on each sheet and tack weld the sketch sheets to the top angle and each other as work progresses. Set the sketch sheets from the outside tank scaffold and progress around the roof edge.
- Note:** Safe work procedure calls for plate tagline and a groundman. The foreman will designate one employee who will have the responsibility to signal the crane operator.
- Note:** To date it has been the responsibility of the foreman (competent person) to determine excessive wind conditions when making plate lifts.
5. Leading edge roof work will begin when personnel must enter onto the partially laid roof to land and fit roof sheets.
- 5.1 At this point of the leading edge roof work the multi employee cable tie off fall protection system will be put into place. Two anchor lugs will be welded at opposite points across the roof and just under the flat leg of the top angle. Make a 3" long, 3/16" vertical up weld with 7018 electrode on the outside of each lug leg. A 7/16" wire rope, horizontal lifeline will be stretched between the anchor lugs. A 1" shackle is to be used at each anchor connection. Be sure to place two cable clamps on each wire rope shackle loop.
- Note:** The Engineering Department has calculated that this system will adequately handle tie off for three personnel. This multi-employee fall protection system is designed for 15,036 lb. strength, including OSHA safety factors.
- 5.2 As the leading edge roof work continues across the tank roof, periodically the multi-employee tie system will need to be reset. This will depend on the lanyard in use. A conventional 6 ft. lanyard will not allow much forward progress, where as, retractable lanyards, at a 15' or 20' length would serve this purpose better.
- Note:** It may be beneficial to leave the multi-employee tie off lugs in place and weld new ones on, as the leading edge roof work progresses. The reason for this is that the welders working behind the leading edge roof work can use the existing lugs and setup personal tie-off systems.
- Note:** Place 1 ft. long, yellow caution tape streamers at 6 ft. intervals on the horizontal lifeline, so the lifeline can easily be seen.
6. The foreman may elect to begin fitting and welding the tank roof behind the leading edge roof work which is in progression. Personnel entering onto the tank roof for this purpose must also meet tie off requirements.
- 6.1 A scaffold mid and top handline can be placed around the edge of the tank roof, at the top angle. A controlled access barricade tape can be strung behind the leading edge roof work to prevent a welder from entering into the leading edge work area. With this fall protection system the welder will wear a fullbody harness per fall protection program which is whenever working 6 ft. above the ground or nearest lower level. Tie-off is not required unless the

welder comes within 6 ft. of the leading edge.

- 6.2 Another alternative for welders to comply with fall protection requirements is to leave the multi-employee tie off lugs in place. The horizontal lifeline can be connected to the welder's lanyard.
7. Areas on the tank roof where roof plates have been omitted for some reason must be barricaded all the way around with yellow caution tape.
Any existing holes cut in roof plate for fittings, vents or manways must be marked and securely covered.

Note: The foreman (competent person) will inspect the roof before work begins each day. Factors such as wind, snow or ice, covers on holes, tape barricades and scaffold handlines will be checked.

- 7.1 After all roof plates have been placed and fit, roof welding will continue until finished. Workers will grind weld burrs off the roof which were created when fitting took place. Watch for fitting gear rip-outs and weld craters. Weld pickups will need to be made on these areas, as the roof is cleaned up. Employees engaged in this work will tie off their harnesses to separate 3/8 " wire rope personal lifelines. The lifelines will be placed around the roof center vent or painters lug. Use 2 cable clamps at the wire rope end loop. These lifelines will be rigged to reach no further than the edge of the tank roof, including length of personal lanyard.
 - 7.2 The tank scaffold safety posts and scaffold handlines around the roof perimeter will be dis-assembled at this time. The handline system will be placed into a container and lifted from the roof with the crane.
8. When all work is completed at the top of the outside tank shell, such as vents, overflows or other fittings, the outside tank scaffold can be removed.
 - 8.1 The scaffold plank will be removed, carried back and stacked. The crane will be used to remove the stacked scaffold plank.
 - 8.2 Personnel on the tank roof will have separate lifelines tied off to the roof vent or painters hook. These personnel will use a rope hook to pull scaffold brackets onto the tank roof. The crane will remove the scaffold brackets from the tank roof.

Note: If an aerial lift is used to reach and remove bracket lugs, the brackets can be removed and lowered by tagline to the ground.

9. An aerial lift is the preferred method of reaching and removing the bracket lugs from the outside tank shell. Unless site conditions prohibit utilizing an aerial lift to reach and remove the scaffold lugs on the outer tank shell, a spider climb rigged from the tank roof may be an alternative to bracket lug removal. The least preferred alternative method is the use of a workbasket in conjunction with the crane.

Note: If a workbasket is used to remove the bracket lugs from tank shell,

it must meet the requirements mentioned in 2.6, Note 3 of this safe work procedure.

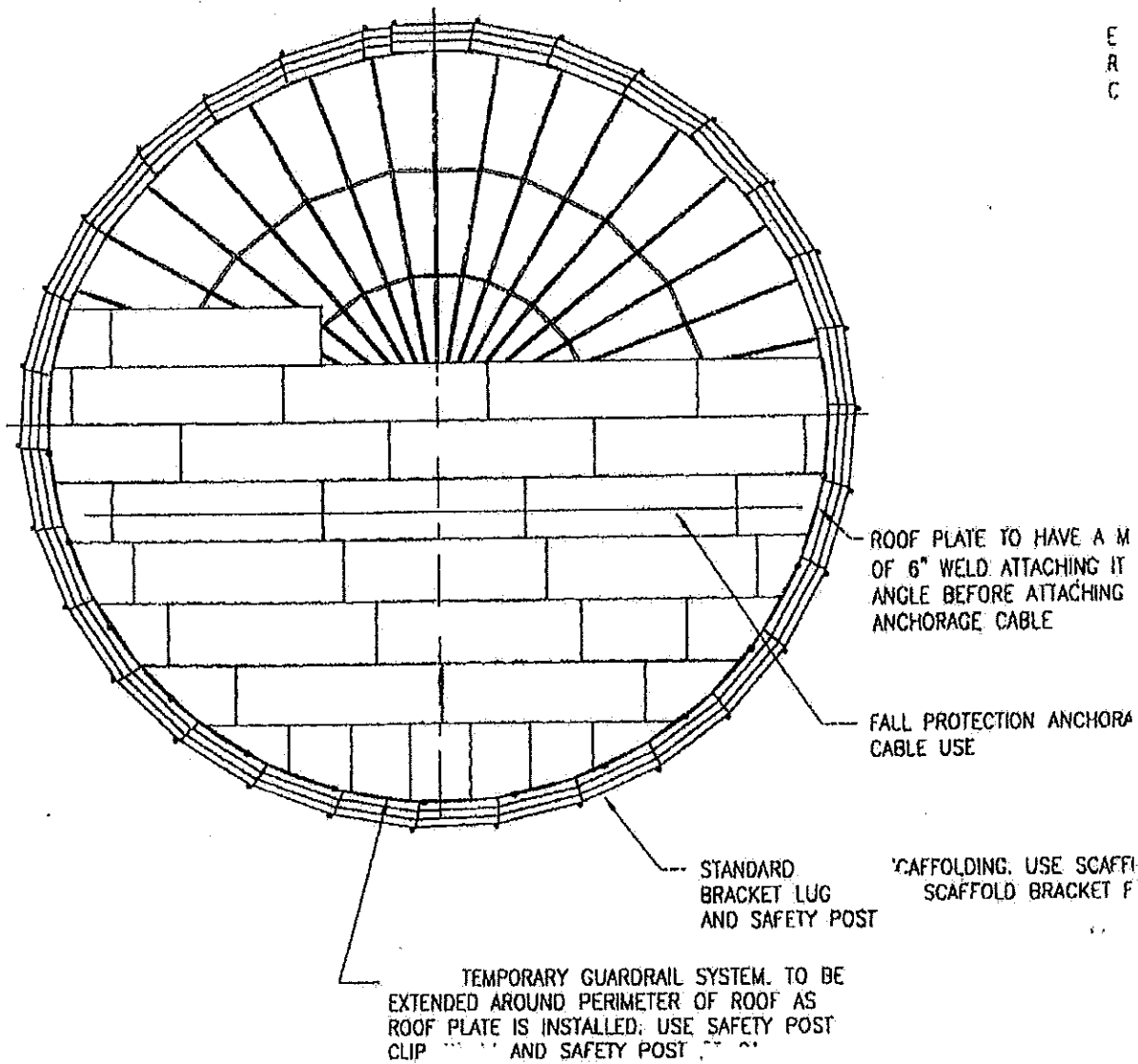
Note: The employee who enters into the spider climb to remove the bracket lugs will have a separate lifeline hooked to the painters hook or center roof vent and the lifeline will attach to the employee's midback D ring. The employee's lifeline must not be of excessive length and just long enough to reach a position in the spider to comfortably accomplish the task of removing the scaffold lugs.

Note: Site condition could prohibit use of an aerial lift outside the tank. Complete access around the outside of the tank, soft earth or a degree of slope which is too great to setup the lift safely. The project manager will consider issues such as this during the initial site visit.

Do not deviate from the above tank roof installation, safe work procedure without contacting the Project Manager or Safety Department.

Safety, It Has A Lot To Do With Attitude!

E
R
C



PLAN
FALL PROTECTION SYSTEM
FOR ROOF PLATE REPLACEMENT

TEMPORARY GUARDRAIL SYSTEM, TO BE
INSTALLED AROUND PERIMETER OF ROOF AS
WORK IS INSTALLED. USE SAFETY POST
AND SAFETY POST

FALL PROTECTION ANCHORAGE
CABLE.

TANK ROOF

TANK SHELL

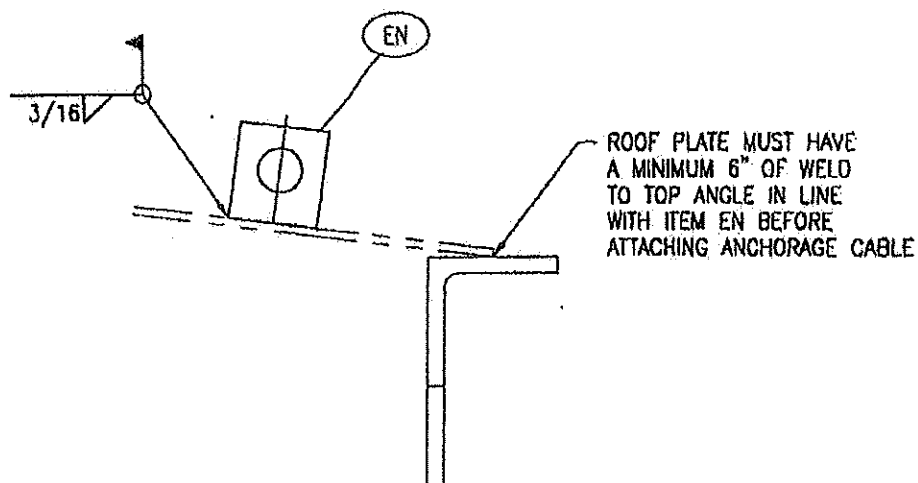
STANDARD SCAFFOLD
BRACKET WITH SAFETY POST
AND CABLE HANDRAIL

ELEVATION
FALL PROTECTION SYSTEM
FOR ROOF PLATE REPLACEMENT

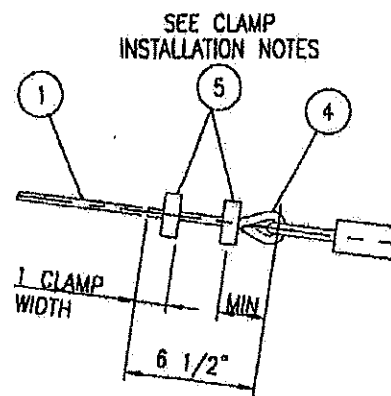
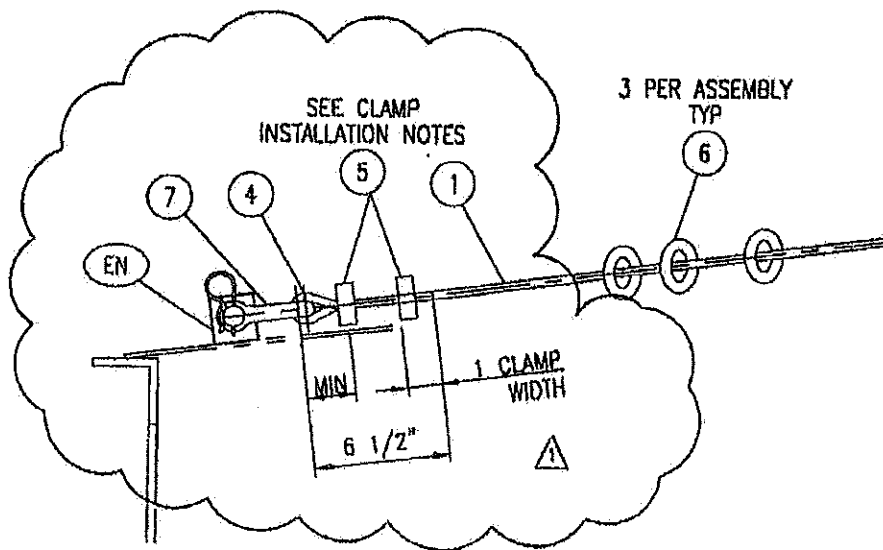
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CLAMP INSTAL

1. REFER TO TABLE ON PAI INSTRUCTIONS. TURN BACK ROPE FROM THIMBLE OR ONE BASE WIDTH FROM TIGHTEN NUTS EVENLY, A TO THE OTHER UNTIL RE.
2. APPLY THE SECOND CLIP. THIMBLE AS POSSIBLE. TI ALTERNATING UNTIL REACH TORQUE.
3. APPLY FIRST LOAD TO TE LOAD SHOULD BE OF EQI THAN LOADS EXPECTED IN RETIGHTEN NUTS TO RECI ACCORDANCE WITH GOOD PRACTICES, THE WIRE ROI BE INSPECTED PERIODICAL GENERAL ADEQUACY.



DETAIL-1



ELEVATION

ION NOTES

IE IN FOLLOWING THESE
PECIFIED AMOUNT OF
P. APPLY FIRST CLIP
END OF ROPE.
INATING FROM ONE NUT
NG RECOMMENDED TORQUE.
NEAR THE LOOP OR
EN NUTS EVENLY,
THE RECOMMENDED

HE ASSEMBLY. THIS
OR GREATER WEIGHT
IE. NEXT, CHECK AND
ENDED TORQUE. IN
ING AND MAINTENANCE
NO TERMINATION SHOULD
FOR WEAR, ABUSE, AND

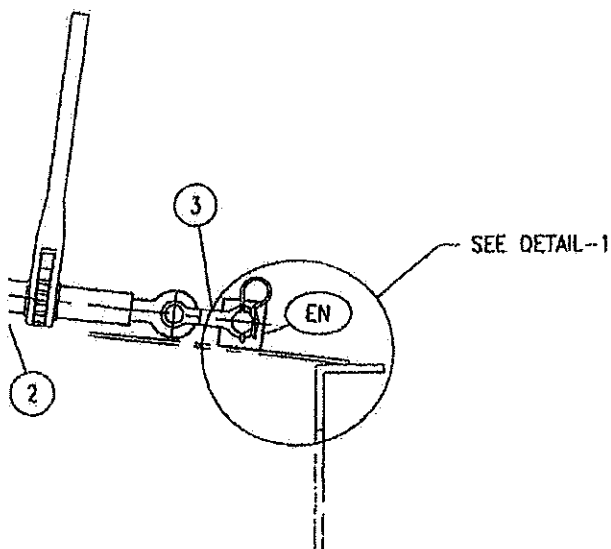


| SHIP LIST | | | | BILL OF MATERIAL | | | | |
|-----------|-----|----|-----|--|--------|-------|-----|-------|
| MK | QTY | MK | QTY | DESCRIPTION | INV NO | MAT'L | WT. | F/P/I |
| EN | 2 | | | ERECTION NUT | 01 | | | |
| AC | 1 | | | FALL PROTECTION ANCHORAGE CABLE | 02 | | | |
| | | 1 | 1 | WIRE ROPE 7/16 x 200' 6 x 36 IWRC | 03 | | | |
| | | 2 | 1 | RATCHET LOAD BINDERY CROSBY #R10, LESS HOOKS | 04 | | | |
| | | 3 | 1 | DOUBLE CLEVIS LINK 1/2" CROSBY #S-247 | 05 | | | |
| | | 4 | 2 | HEAVY DUTY THIMBLE 7/16" CROSBY #G-414 | 06 | | | |
| | | 5 | 4 | FIST GRIP CLAMPS 7/16" CROSBY #G-429 | 07 | | | |
| | | 6 | 3 | ROUND RING 1/2" x 2" WELDED | 08 | | | |
| | | 7 | 1 | SHACKLE 1/2" CROSBY #G-213 | 09 | | | |

NOTE:

- WPG - 1 OR HIGHER UNLESS NOTED
- ALL CROSBY PARTS SUBJECT TO "OR EQUAL" EXCEPT ITEM 5. NO SUBSTITUTION ALLOWED ON CLAMPS. TYPE OF WIRE ROPE, ITEM 1, CANNOT BE CHANGED.
- ITEM 1 TO BE USED FOR TANKS UP TO 200' DIA. FOR LARGER DIA TANKS USE 300' LONG WIRE ROPE.

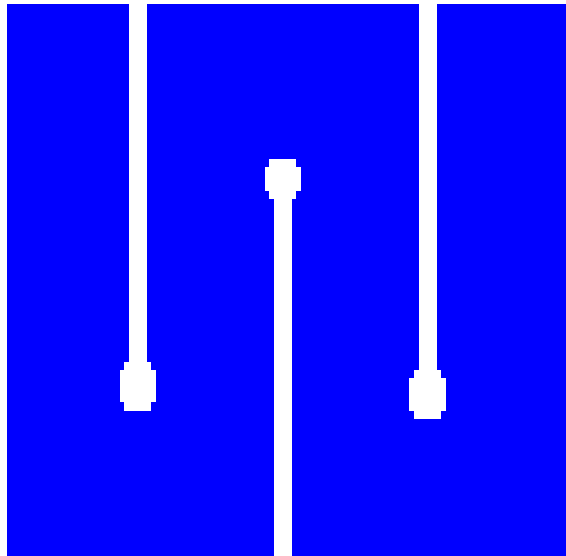
| REQUIRED LOADS | | |
|----------------|--------------------|-------------------|
| ITEM | WORKING LOAD LIMIT | BREAKING STRENGTH |
| 1 | 3000 LBS | 18,750 LBS |
| 2 | 3000 LBS | 15,000 LBS |
| 3 | 3000 LBS | 15,000 LBS |
| 4 | 3000 LBS | 15,000 LBS |
| 5 | 3000 LBS | 15,000 LBS |
| 6 | 1000 LBS | 5,000 LBS |



APPENDIX 24

ELECTRICAL SAFETY PROGRAM

JJ White Inc. Electrical Safety Program



The "C-Change" Initiative:

1. Change behaviors.
2. Challenge ourselves to re-think how we work.
3. Certify the results on a daily basis.

JJ White Inc. Electrical Safety Program

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JJ White Inc. Electrical Safety Program

I. INTRODUCTION

Electricity is our most versatile form of energy; it is vital to our business. Electricity can be used safely if it is installed, maintained, and used properly. However, misuse of electrical energy can cause severe damage to the human body and can cause secondary injuries such as falls. Small currents passing through vital organs such as the heart can even cause death and current through other body parts can lead to amputation and permanent paralysis; while arc flash can cause blindness and severe burns. In addition, fires and explosions resulting from electrical shorts can cause serious production stoppages for our clients. At JJ White, we will use and maintain electrical equipment for our clients in an approved and safe manner. The following written program is provided for guidance in meeting the requirements of OSHA 29 CFR Subpart S, OSHA 29 CFR 1926 Subpart K, NFPA 70E, National Electric Code & applicable Client Electrical Standards.

II. PURPOSE

The purpose of the JJ White, Inc. Electrical Safety program is to:

- Guide the correct and approved safe usage of electrical equipment and devices.
- Reduce and eliminate the conditions and work practices that may lead to electrical shock, equipment damage, and fire.
- Comply with OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, **NFPA 70E**, and the National Electric Code as applicable.
- Comply with our Client's Electrical Safety Standards

III. SCOPE

The intent of this program is to cover electrical safety related work practices for employees (both qualified and unqualified) working on, near, or with exposed energized electrical parts. This may include:

- Wiring installations, such as electric conductors and equipment within, or on, buildings, or other structures, and on the premises such as yards, parking and other lots.
- Wiring for connection to supply such as installations of conductors that connect to the supply of electricity; and
- Installation of other outside conductors on the premises; as well as
- Optical fiber cable where such installations are installed along with electric conductors.

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This **program** applies to electrical hazards of 50 volts or higher, although individual exposures of less than 50 volts may be hazardous if other conditions exist such as higher hertz or working in areas classified as "Wet/Damp Locations". These exposures shall be evaluated individually to determine if special precautions are necessary.

The on-site Electrical General Foreman is the NFPA 70E designee and he/she is the responsible person for the implementation and maintenance of this program.

IV. DEFINITIONS

Acceptable. An installation or equipment is acceptable and approved within the meaning of OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, and NFPA 70E if it is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or if it is inspected or tested by another Federal agency, or by a State, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code and is found in compliance with the provisions of the National Electrical Code.

Accepted. An installation is "accepted" if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes.

Approved. Acceptable to the authority enforcing this subpart. The authority enforcing OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, and NFPA 70E is the Assistant Secretary of Labor for Occupational Safety and Health. The definition of "acceptable" indicates what is acceptable to the Assistant Secretary of Labor, and therefore approved within the meaning of this Subpart.

Approved for the purpose. Approved for a specific purpose, environment, or application described in a particular standard requirement.

Arc Flash. A projection of energy when a phase-to-ground, or phase-to-phase, fault occurs. The jump of energy creates a super pressure wave similar to a strike of lightning.

Arc Rating. The maximum incident energy resistance demonstrated by a material (or a layered system of materials) prior to break-open or at the onset of a second-degree skin burn. Arc rating is normally expressed in cal/cm².

Bonding. The permanent joining of metallic parts to form an electrically conductive path that will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

Branch circuit. The circuit conductors between the final over-current device protecting the circuit and the outlet(s).

Cabinet. An enclosure designed either for surface or flush mounting, and provided with a frame, mat or trim in that a swinging door or doors are or may be hung.

Cable tray system. A cable tray system is a unit or assembly of units or sections, and associated fittings, made of metal or other noncombustible materials forming a rigid structural

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system used to support cables. Cable tray systems include ladders, troughs, channels, solid bottom trays, and other similar structures.

Certified. Equipment is “certified” if it (a) has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner, or (b) is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and (c) it bears a label, tag, or other record of certification.

Circuit breaker. 600 volts nominal, or less. A device designed to open and close a circuit by non-automatic means and to open the circuit automatically on a predetermined over-current without injury to itself when properly applied within its rating.

Conductor. (i) Bare. A conductor having no covering or electrical insulation whatsoever. (ii) Covered. A conductor encased within material of composition or thickness that is not recognized as electrical insulation. (iii) Insulated. A conductor encased within material of composition and thickness that is recognized as electrical insulation.

Device. A unit of an electrical system that is intended to carry but not utilize electrical energy.

Disconnecting means. A device, or group of devices, or other means by that the conductors of a circuit can be disconnected from their source of supply.

E.I.C. Energy Isolation Checklist.

Equipment. A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like, used as part of, or in connection with, an electrical installation.

Exposed. (As applied to live parts.) Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated.

Fuse. An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it.

Ground. A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

Grounded. Connected to earth or to some conducting body that serves in place of the earth.

Ground-fault circuit-interrupter. A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the over-current protective device of the supply circuit.

Guarded. Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms, to remove the likelihood of approach to a point of danger or contact by persons or objects.

Listed. Equipment is listed if it is of a kind mentioned in a list that (a) is published by a nationally recognized laboratory that makes periodic inspection of the production of such

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equipment, and (b) states such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner.

Limited Approach Boundary. An approach limit at a distance from an exposed live part within which a shock hazard exists.

Overcurrent. Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

Overload. Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity that, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (See over-current.)

Qualified person. One familiar with the construction and operation of the equipment and the hazards involved.

Note 1: Whether an employee is considered to be a “qualified person” will depend upon various circumstances in the workplace. It is possible and, in fact, likely for an individual to be considered “qualified” with regard to certain equipment in the workplace, but “unqualified” as to other equipment. (See OSHA Standard 1910.332 & OSHA 29 CFR 1926.449 for training requirements that specifically apply to qualified persons.)

Note 2: An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person is considered to be a qualified person for the performance of those duties.

R.O.I.S. Remote Operators Isolation Switch.

Restricted Approach Boundary. An approach limit at a distance from an exposed live part within which there is an increased risk of shock, due to electrical arc over combined with inadvertent movement, for personnel working in close proximity to the live part.

Safe Work Zone. The boundary established for the safe work zone will be no less than what is specified for the “Flash Hazard Boundary” in the Arc Flash Hazard Analysis. An additional 6 feet will be added to this distance whenever possible.

Shock Hazard. A dangerous condition associated with the possible release of energy caused by contact or approach to live parts.

Switches.

- (i) General-use switch. A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.
- (ii) General-use snap switch. A form of general-use switch so constructed that it can be installed in flush device boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this subpart.

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- (iii) Isolating switch. A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.
- (iv) Motor-circuit switch. Rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.
- (v) R.O.I.S. A Remote Operators Isolation Switch.

Voltage, nominal. A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/208, 120/240, 480Y/277, 600, etc.). The actual voltage at that a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

V. RESPONSIBILITIES

Involvement of personnel from all levels of JJ White, Inc., is required to effectively carry out all electrical safe work practices program goals and to implement a systematic program. The primary responsibilities of each group in the organization are discussed below.

A. **Top Management** supports and is openly committed to the electrical safe work practices program; they place safety and health on the same line of importance as production. As leaders of the electrical safe work practices program, their responsibilities are to:

1. Clearly communicate management's commitment to the program;
2. Establish electrical safe work practices program goals and objectives;
3. Provide the authority and resources (including, but not limited to financial) necessary to carry out all assigned program activities;
4. Designate staff responsibilities and create an organization of individuals to attain these goals and objectives; and
5. Establish a system of accountability to assure that all program-related duties are properly carried out according to established timelines.

B. **The Site Safety Manager** has the responsibility to:

1. Maintain all documentation on electrical safe work practices training.
2. Maintain inventory of lockout/tagout equipment.
3. Maintain and inspect inventory of personal protective equipment to insure that it is in a safe, reliable condition.
4. Act as a resource for Foremen, Line Managers, and employees for information, training materials, and protective equipment and tools.

C. **Foremen and/or Line Managers** have the responsibility to:

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1. Recognize and respond to any changes in employee behavior that indicate the need for training or retraining
2. Enforce strict adherence to the required safe work practices and protective equipment required.
3. Recognize any electrical safe work practices issues in their area;
4. Alert management of any new electrical applications in their area for that employees may need additional training.
5. Re-enforce electrical safe work practices training concepts.

D. Employees have the responsibility to:

1. Use appropriate safe work practices and protective materials to work safely;
2. Ask questions if they do not feel comfortable with a work assignment involving exposure or potential exposure to electrical hazards and the necessary safe work practices or protective equipment.
3. Inform management if they feel that additional training is required for a job or job task.
4. Identify any areas of concern in their job/work area that present an electrical safe work practices hazard.

VI. EMPLOYEE TYPES

Under the requirements of the standard, there are two types of employees identified: Qualified and unqualified. The primary difference between these two employee types is training.

- A. Qualified employees are those employees who face a risk of electrical shock that has not been reduced to a safe level (less than 50 volts) and have had training in recognizing and avoiding the hazards of working on, near, or with exposed electrical parts. These employees must be familiar with the hazards or potential hazards, which may be part of the system or equipment they will be working on. Since employees may not be familiar with hazards associated with all pieces of equipment, it is possible to be qualified on one piece of equipment and not on another.

Examples of employees who need to be qualified (depending on voltage level of exposure):

- Technicians;
- Electricians;

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- Maintenance personnel who may work on electrical systems circuits or equipment
- Foremen, if they will be completing work that may expose them to electrical hazards.
- Any other person whose job responsibilities require or may require working on live or exposed de-energized circuits.

B. Unqualified employees are those who face a risk of electrical shock that has not been reduced to a safe level (less than 50 volts) and have had little or no training as far as recognizing and avoiding the hazards of working on, near, or with exposed electrical parts. Unqualified individuals are not to work live electrical, however, may be exposed to the hazards inherent to electricity due to their proximity to the electrical hazard.

Examples of employees who must be trained to an unqualified status:

- Maintenance employees who do not work on electrical systems but may work in an area where electrical hazards exist or electrical work is taking place.
- Supervisors who do not work on but may work in areas where electrical hazards exist or electrical work is taking place.
- Any other person whose job responsibilities require or may require potential exposure to live or exposed de-energized circuits.

Unqualified personnel must also be trained in any specific safe practice necessary for their job.

Unqualified individuals may work on an exposed de-energized circuit or equipment provided that a qualified individual has verified, using proper procedures, that the circuit or equipment is not live and that the circuit or equipment has been properly locked out by all authorized personnel working on the circuit or equipment. Only qualified personnel will work on energized equipment.

The provisions of this written program cover all work performed by unqualified individuals. Unqualified employees must be trained in any specific safe practices necessary for their safety.

For qualified individuals, work related to:

- Generation, transmission, and distribution installations;
- Communications installations;
- Installations in vehicles; and
- Railway installations are not covered by this written program but they are covered by separate OSHA standards.

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Other Personnel:

- All other personnel (i.e., office personnel) will receive electrical safety awareness training as required by the location-specific low voltage electrical safety practices and procedures.

VII. SAFE WORK PRACTICES

All employees will be trained in the recognition of safe and unsafe electrical conditions.

Only qualified employees, or licensed contractors will be permitted to repair, replace or adjust electrical equipment and devices or systems that must be rated at 600 volts or less.

JJ White Inc.'s Hazardous Energy Control (Lockout/Tagout/Verify) procedures and/or the Client's Hazardous Energy Control procedures shall be utilized for all work that will or may potentially expose the employee to electrical energy sources. Before performing any work directly involving work on electrical equipment or systems that is capable of being re-energized, an Energy Isolation List (EIL) shall be completed for that work.

EIL for work tasks that are not directly related to electrical work but do have exposure to electrical energy sources shall contain the steps taken to reduce the electrical energy to a zero energy state.

Specific safety-related work practices must be consistent with the nature and extent of the associated electrical hazards the employee may be exposed to. In all cases, lockout/tagout is the preferred safe work practices method and must be used.

- ⇒ **No employee shall work on High Voltage conductors or component 600 volts or greater. The on-site Electrical General Foreman will arrange for qualified persons only to work on High Voltage conductors or components as may be required.**

Maintenance or installation work on energized parts is prohibited unless approved by the Site Location Manager.

(See Attachment F for the Energized Electrical Work Permit process)

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A. De-energized Parts

Employees who will be exposed to live parts must de-energize these parts before working on or near these parts unless it can be demonstrated that de-energizing this equipment or circuit will **create additional or increased hazards or is infeasible** due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground do not need to be de-energized if there will be no increased exposure (over that of working on a de-energized circuit) to electrical burns or to explosion due to electrical arcs. **The preferred method is to lock and tag out the appropriate equipment or circuit whenever possible.**

1. Working on or near exposed de-energized parts

These safe work practices apply to work on exposed de-energized parts or close enough to them to expose the employee to any electrical hazard they present. Conductors and parts of the electrical equipment that have not been locked or tagged out must be treated as **energized parts** and requirements related to working on energized systems of this section will apply.

Safe procedures for de-energizing electrical circuits and equipment must be determined for each circuit or equipment before these devices are to be de-energized. (See also JJ White Inc., Hazardous Energy Control). For each piece of equipment or circuit, all electrical sources must be identified and appropriate lockout/tagout procedures must be developed. A review of these procedures for electrical hazards:

- a. The equipment or circuit to be worked on must be disconnected from all electrical energy sources. Control circuit devices such as push buttons, selector switches, and interlocks may not be used as the only means for de-energizing equipment or circuits.
- b. All stored electrical energy sources that may endanger personnel must be released. Capacitors must be discharged and high capacitance items must be short-circuited and grounded if an electrical hazard exists. If capacitors are handled during this process, they must be treated as energized.
- c. Stored non-electrical energy that might reenergize electrical circuit parts must be blocked or relieved to eliminate the potential for this re-energization to occur.
- d. A **lock and tag** must be placed on each disconnecting means used to de-energize circuits and equipment, by each authorized employee, on that work is to be performed. The only exceptions to this are:
 - If a lock cannot be applied, or if it can be demonstrated that tagging provides an equivalent level of safety as a lock, then a tag may be used without a lock. If a tag only is

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used, an additional measure of safety that provides a level of safety equivalent to a lock must be taken to supplement the tag only. This may include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device, or have another qualified electrician stand at the location.

2. Verification of De-energized State

Before any electrical equipment can be worked on as de-energized, a qualified individual must open the equipment disconnect, operate the start/stop controls, and/or otherwise verify that the equipment cannot be reenergized. In addition, the qualified individual should use appropriate testing equipment to verify that the exposed equipment or circuit is de-energized. **If the circuit is 110 volts, or greater, the test equipment must be checked for proper operation both before and after use.**

3. Reenergizing equipment

The following procedure will be followed before reenergizing electrical equipment or circuits:

- a. A qualified individual will conduct tests and visual inspections as necessary to insure that the electrical equipment or circuit can be safely energized.
- b. Employees exposed to the circuit or hazards will be warned to stay clear of the equipment or circuit.
- c. Each lock and tag must be removed by the employee who applied it.

B. Energized Parts

No maintenance or installation work is to be performed on energized parts. A qualified person, using listed and rated insulated tools and wearing appropriate PPE (as specified in NFPA 70E), may perform the following on energized parts:

1. **Testing, including voltage, current, phasing meter checks, system tuning and other testing.**
2. **Circuit identification.**
3. **Replace control fuses, which are not under load, on electrical systems less than 300 volts.**
4. **Install devices engineered and designed by the manufacturer to be installed or removed without de-energizing.**

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5. In order to work on live control circuits that cannot be completely de-energized due to the continuous nature of the operation, equipment design or operational limitations, a Job Safety Analysis shall be performed, **an Energized Electrical Work Permit shall be completed, and approved in writing by the On-Site Electrical General Foreman, the Site Manager, and the Site Safety Manager before the work can begin. In addition, the Project Manager & Corporate Safety Director must be notified before work can begin. (See Attachment F for the Energized Electrical Work Permit process)**

C. Arc Flash Protection

1. An Arc Flash Hazard Assessment will be completed at the location by the Electrical General Foreman prior to the initiation of work. Electrical panels and enclosures will be labeled with the appropriate Arc Flash PPE Requirements, Flash Protection Boundary, and Limited Approach Boundary information.
2. All personnel servicing electrical equipment will be required to wear the appropriate level of arc flash protection. If the arc flash protection is not available, or if the personnel are not sure of any of the protective requirements, the job will be stopped and the location Electrical General Foreman shall be notified.
3. The definition of an Electrical Arc Flash Hazard Boundary is the distance from an arc flash hazard source where arc thermal energy applied to the skin is equal to 1.2 cal/cm^2 which is the onset of a second degree burn to the skin. Additional PPE is required within this area for protection from arc thermal energy.

When an arc flash hazard is present, personnel must know the Electrical Arc Flash Hazard boundary. If a person is within the Electrical arc Flash Hazard Boundary, the PPE chosen will be to protect to less than or equal to $1.2 \text{ calories/cm}^2$. Elimination of the Arc Flash Hazard ends the need for an Electrical Arc Flash Hazard Boundary.

4. If an Arc Flash Hazard Analysis has not been performed, refer to the NFPA 70E Table 130.7(C)(9)(A) for the Arc Flash Hazard Risk Category and to the following table for the Flash Hazard Boundary.

| Electrical System Voltage Phase to Phase | Electrical Arc Flash Hazard Boundary |
|--|--------------------------------------|
| KV | Feet |
| .051 - .600 | 4.0 |
| .601 - .999 | 6.0 |
| 1.0 & Greater | See Arc Flash Analysis |

5. The Restricted Approach Boundary is defined as the minimum distance that a qualified person shall stay away from the exposed, energized

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conductors or circuit parts. Crossing the restricted approach boundary. is considered the same as touching the exposed, energized component, thus requiring an electrical live work permit. Unqualified personnel may not approach closer than the arc flash hazard boundary for energized circuits of 50 volts or greater.

| Minimum Approach Distances for Qualified Personnel | |
|--|---------------|
| 0-50 Volts | Not specified |
| 51-300 Volts | Avoid contact |
| 301-750 Volts | 1" |
| 751-15KV Volts | 2' 2" |
| 15.1-46KV Volts | 2' 10" |
| 46.1-72.5KV Volts | 3' 6" |

D. Personal Protective Equipment

1. An employee's layers of personal protection against electrical hazards starts with the first layers of clothing that he/she puts on. For this reason, electrical workers are required to wear only 100% cotton undergarments, Flame Resistance (FR) rated long sleeve shirts and pants, and Electrically Hazard (EH) rated soled shoes. Cotton T-shirts may not have any logos imprinted or embroidered on them to include decals, stickers, silk-screens, etc.,. Electrical workers must strictly adhere to the jewelry policy. No jewelry and/or metal framed glasses are permitted to be worn while performing electrical work or work that presents electrical hazards.

Personnel shall wear the appropriate clothing and Personal Protective Equipment (PPE) when working around high and low voltage systems. The following chart defines the level of personal protective equipment that shall be correctly utilized for each of the tasks listed.

| ELECTRICAL PPE CHART | | | | | |
|--|-----------------------|-----------------------|-----------------------|------------------------|------------------------|
| Arc Hazard Level | Level 0 | Level 1 | Level 2 | Level 3 | Level 4 |
| Potential arc fault energy protection | 0 cal/cm ² | 5 cal/cm ² | 8 cal/cm ² | 25 cal/cm ² | 40 cal/cm ² |
| Untreated natural fiber long-sleeve shirt/ | X | | | | |
| Untreated natural fiber pants | X | | | | |
| 100% cotton underwear, including short-sleeve t-shirt | | | X | X | X |
| FR long-sleeve shirt and pants | | X | X | X | X |
| Safety glasses | X | | | | |
| Safety glasses with side shields and non-metallic frames | | X | X | X | X |
| Electrically rated safety shoes | | X | X | X | X |
| Hearing protection | | | X | X | X |
| Class E 20kV hardhat | | X | X | X | X |
| Insulated gloves/leather protectors (select appropriate voltage class) | | X | X | X | X |
| FR mid-calf length smock, or coveralls – Total ATPV must be at least 8 cal/cm ² | | | X Note 1 | | |

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| | | | | | |
|---|--|--|---|---|---|
| FR mid-calf length smock, or coveralls – Total ATPV must be at least 25 cal/cm ² | | | | X | |
| Wrap around face shield, amber tinted proportionate providing UV protection | | | X | X | |
| FR flash hood or cape | | | | X | |
| FR switcher's hood with wrap around face shield, amber tinted proportionate providing UV protection rated 50cal/cm ² | | | | | X |
| Multi-layered flash suit or jacket & pants providing ATPV of at least 40 cal/cm ² | | | | | X |

Note 1 – If FR pants and shirt provide ATPV of at least 8 cal/cm², FR smock or coveralls not required.

2. Insulating rubber gloves (in service) will be dielectrically tested every six months. Insulating rubber gloves will be marked with a unique identifying number for control and inventory purposes. The Location Electrical General Foreman will maintain an inventory of all insulating rubber gloves. Records of dates of inspections and their results will be maintained.

Insulating rubber gloves and sleeves shall be stored in their appropriate canvas bags, cuff down. **All gloves shall be inspected, used, and maintained per the manufacturer's recommendations, but not less than one (1) year.** If the gloves are damaged or outdated, the employee shall turn the gloves inside out and place them on top of the canvas storage bag. Sleeves shall be visually inspected prior to each use.

3. All insulating live-line-tools, insulating rubber blankets/mats/cable and bus covers shall be dielectrically tested every 12 months. The on-site Electrical General Foreman will maintain an inventory of all this type of equipment. Records of dates of inspections and their results will be maintained.
4. All tools used for handling energized electrical components shall be approved by the Location Electrical General Foreman and properly inspected before each use.

E. Equipment Access Interlock Systems

Interlock systems shall not be bypassed or otherwise rendered inoperative while the equipment is energized except when phasing conductors following new or revised installations or when testing is being performed. Only a qualified person shall perform these tasks. Upon completion of testing, the interlock system shall be restored to full operable condition. Under no other circumstances shall the interlock system be bypassed or otherwise rendered inoperative.

F. Pre-Work Safety Evaluation

Before a low voltage electrical work operation begins, personnel shall evaluate the safety concerns and precautions regarding the task. Whenever work conditions or methods change that could potentially compromise personnel safety, additional safety evaluations shall be conducted. Pre-work safety evaluations may include:

1. Hazards.
2. PPE required.

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3. Coverage of the safe work zone.
4. Lock/tag/verify process.
5. Work procedures involved.
6. Groups and/or personnel involved and their tasks.

(Note: See Electrical Safety Pre-Job Checklist in Attachment "G" to fulfill this requirement)

G. Fall Protection

A fall protection assessment shall be conducted before any task begins. Fall protection shall meet the requirements of the location's fall protection program.

H. Raising/Lowering Material & Equipment

All small equipment and tools used aloft shall be raised and lowered by a non-conductive hand-line, canvas bucket, or other suitable method. Nothing shall be thrown or intentionally dropped. Personnel shall take care when working overhead to prevent dropping tools and materials. Personnel below are to stay clear of overhead work to avoid being struck by falling objects.

I. Safe Work Zone

The boundary established for the safe work zone will be no less than what is specified for the "Flash Hazard Boundary" in the Arc Flash Hazard Analysis. An additional 6 feet will be added to this distance whenever possible.

Where there has been no Arc Flash Hazard Analysis performed, a boundary of 4 feet will be used for voltages up to 600. An additional 6 feet will be added to this distance whenever possible.

The physical nature of the Safe Work Zone for low voltage tasks must be determined by the potential for employees not involved in the work to enter a hazardous area and/or to adversely affect the safety of the employees performing work within an electrically hazardous area. One or both of the following methods must be used to define/protect the safe work zone.

1. Barricades or Safety Signs

A standard "Danger Electrical Hazard" sign and red "Danger" tape or non-conductive chain are examples of these devices.

The devices must be placed to prevent any unsuspecting employee from unintentionally entering the area.

2. Attendants

May be used instead of barricading if the attendant is able to prevent unauthorized persons from entering the safe work zone.

Must be used in conjunction with barricades if there is reason to believe that the barricades are not sufficient.

Cannot be the same individual doing the work.

Does not need to be electrically qualified if he/she remains outside of the arc flash hazard boundary while performing attendant duties.

May perform no other duties while assigned as an attendant.

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J. Qualified Persons Tasks

Only a Qualified Person may perform the following tasks:

1. Splicing of conductors
2. Repairing damaged portable electric tools, cords, and equipment
3. Defeating/bypassing of safety interlocks
4. Using electrical testing equipment
5. Opening or removing covers to electrical cabinets or panels
6. Accessing the arc flash boundary of an energized circuit

K. Mobile Equipment

When mobile equipment is used within the Limited Approach Boundary, de-energize or insulate exposed, energized parts. If this is not possible, barricade the mobile equipment. Personnel operating mobile equipment that could accidentally enter the Limited Approach Boundary shall have received training on the potential electrical shock hazards associated with equipment operation under these conditions. Both qualified and unqualified personnel shall follow the Minimum Approach Distances.

L. General Safe Electrical Work Practices

1. Do not operate electrical disconnect switches unless you have been trained, qualified, or authorized to do so. When authorized to operate safety switches, use the left hand so your body will be clear of equipment in case an explosion should occur. Keep right hand clear of any metal work and do not look directly at the switch when operating it. Never operate a disconnect switch under a load (e.g., while equipment is operating).
2. When servicing or operation of electrical equipment or devices is required, adequate illumination shall be provided to conduct the work safely.
3. Electrical workers must strictly adhere to the jewelry policy. No jewelry, belt buckles, and/or metal framed glasses are permitted to be worn while performing electrical work or work that presents electrical hazards.
4. Excellent housekeeping shall be maintained around electrical equipment and devices, especially before and during the performance of related work.
5. Any work area where energized equipment or systems are present shall be barricaded, signed, and controlled so as to prevent contact with such equipment or systems by unqualified persons.
6. No crane, aerial device or other equipment shall be allowed closer than 10 feet of exposed energized conductors.
7. Anytime that work activity is undertaken that presents the possibility of contact with underground cables or other current carrying components, those lines and/or equipment and/or systems shall be identified as to location prior to commencement of the work activity. Digging, excavating, or cutting through floors or walls shall be done only with the approval of the Electrical General Foreman. See JJW/Client Excavation & Trenching Policy.

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8. Electrical cords and equipment will be repaired with approved materials only. "Duct" or "electrical" tape should never be used to repair electrical cords or welding leads.
9. All portable ladders used for electrical work shall have nonconductive side rails. Aluminum or wood ladders shall not be utilized when performing electrical work.
10. Safe work practices and standard operating procedures shall be established to address the handling of conductive materials, tools, or equipment in areas where there is potential exposure to energized systems or equipment.
11. If a circuit breaker trips more than once, electrically qualified personnel shall be notified to identify the cause of the trip and reset the circuit breaker. The continuous re-setting of circuit breakers is prohibited.
12. Under NO circumstances may a non-electrically qualified person open an electrical enclosure with exposed conductors to re-set a circuit breaker or other re-set device (includes motor overloads).

VIII. EQUIPMENT SAFETY REQUIREMENTS

(See Attachment H for Portable Power Tool and extension cord inspection tracking)

A. Design Criteria

1. New electrical equipment installations shall be capable of accepting a Lockout Device to lock the equipment in the open/de-energized position.
2. Electrical equipment that is installed and used shall be listed, labeled, or certified. Only equipment that is in good, serviceable, and safe condition shall be used.
3. All installations of electrical equipment shall only be made with the approval of the Electrical General Foreman and the Client.
4. Live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact according to OSHA 1910.303(g)(2) and OSHA 29 CFR 1926.403(i)(2) using the following methods:
 - Approved cabinets or enclosures
 - Location in a room, vault, or similar enclosure that is accessible only to qualified persons.
 - Suitable permanent, substantial partitions, screens or guards
 - By elevation of 8 feet or more above the floor or other working surface or platform so elevated and arranged as to exclude unqualified persons.
 - By distance (i.e., 10 foot rule)
5. All equipment shall contain legible markings that include the manufacturer's name, trademark, or other descriptive marking by which the organization

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responsible for the product may be identified; other markings giving voltage, current, wattage, or other ratings as necessary; what its fed from and what it feeds; and the applicable Arc Flash Rating. The marking shall be of sufficient durability to withstand the environment involved. Additionally, the equipment or device shall clearly indicate an energized “on” and de-energized “off” position.

6. In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.
7. Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.
8. All equipment used in installations shall be installed and used according to the manufacturer’s specifications.
9. Overhead lamps/lights for general illumination will protected from accidental contact or breakage as per OSHA 1910.305(a)(2)(iii)(F), OSHA 29 CFR 1926.445 (a)(2)(ii)(E), and OSHA 29 CFR 1926.445 (a)(2)(ii)(F)
10. Equipment, that will be used for interrupting current, shall have a rating sufficient for the system it is intended to operate. All equipment shall have over-current protection according to the requirements of OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, and NEC.
11. All equipment shall be securely mounted so as to prevent unintentional displacement, and it shall be located so as to provide for adequate ventilation and air circulation as required within the manufacturers specifications and other applicable regulatory standards.
12. If the equipment installed contains arcing parts, then it shall be located so that it is separated from all combustible or flammable materials.
13. No modifications to existing systems shall be accomplished that increase the load beyond the rated capacity of the equipment and/or system.
14. Sufficient access and working space shall be provided and maintained about all electric equipment in accordance with OSHA 29 CFR 1910.303(g) and OSHA 29 CFR 1926.403(i) thru OSHA 29 CFR 1926.403(j)(4) to permit ready and safe operation and maintenance of such equipment. A three-foot minimum clear distance shall be maintained at all times.
15. Suitability of equipment for an identified purpose may be evidenced by listing or labeling for that identified purpose. An assessment of the equipment to be used in an installation shall be performed by a qualified person prior to utilization of such equipment. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to

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employees. Safety of equipment shall be determined using the following considerations:

- Suitability of equipment for intended use
- Mechanical strength
- Insulation
- Heating effects
- Arcing
- Hazardous location classification
- Employee safeguards

B. Extension Cord Sets

1. Extension cord sets shall be suitable for the intended environment and voltage and shall be listed by an appropriate product safety testing and certification organization. All extension cords must be of the three-wire type. Extension cords must be designed for hard or extra hard use at 14/3 or 12/3 gage, rated for 15 Amps.
2. Custom made extension cord sets shall be suitable for the intended environment and voltage and shall be made of listed and approved parts. Custom made extension cord sets shall be assembled and tested by a qualified electrician. Splices are not permitted in extension cords.
3. Extension cord sets shall not be used as permanent wiring.
4. Extension cord sets shall be protected from mechanical damage, oil, solvents, abrasion, pinch points and sharp objects, vehicles and pedestrians. Worn, frayed, oil soaked electrical cords and cables shall not be used.
5. Extension cord sets shall be placed so they do not cause slip, trip, or fall hazards.
6. Extension cord sets shall be secured or suspended using non-conductive means. Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.
7. All extension cord sets shall be visually inspected prior to each use. Any worn, frayed, damaged, crushed, pinched, spliced or defective extension cord sets shall be immediately removed from service.
8. Documented inspections of extension cord sets shall be performed per the requirements of local regulations or consensus standards.
9. Extension cord sets shall not be unplugged while the equipment is operating
10. Extension cord sets supplied from a disconnect switch shall not be unplugged with the disconnect switch closed.

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C. Portable Electric Tools

1. Portable electric tools shall be suitable for the intended task, rated for the intended environment & voltage, and shall be listed by an appropriate product safety testing and certification organization. All new portable electric tools shall be double insulated, if available.
2. All portable electric tools shall be visually inspected prior to each use and the casing and cords shall be free of apparent electrical shock hazards. Any damaged portable electric tool shall be immediately removed from service.
3. Each portable electric tool shall be diagnostically tested on a quarterly basis or any time damage is suspected. A process shall be created and implemented to document this periodic inspection.
4. Use a GFCI with any extension cord connected portable electric tool.
5. All portable tools must be grounded, unless they are approved double-insulated type.
6. Droplights shall have a substantial guard over the bulb, be designed for hard or extra hard use, have a substantial molded handle.

D. Portable Electric Power Strips

1. Portable electric power strips shall be suitable for the intended environment and voltage, shall incorporate a circuit protection device, and shall be listed by an appropriate product safety testing and certification organization.
2. Portable electric power strips shall be protected from mechanical damage, oil, solvents, abrasion, pinch points and sharp objects.
3. Portable electric power strips shall be placed so they do not cause slip, trip, or fall hazards.
4. Portable electric power strips shall be inspected periodically for damage. Any damaged portable electric power strips shall be immediately removed from service.
5. Portable electric power strips shall not be connected to each other.

E. Anti-Restart Devices

Anti-restart devices shall be installed on all fixed shop-type equipment where restart after a power interruption is possible. Anti-restart devices are to be periodically tested for proper operation.

F. Appliances and Vending Machines

1. Appliances used at the location, such as Microwaves, Radios, Refrigerators and Coffee Makers, shall have no exposed electrical hazards and shall be listed by an appropriate product safety testing and certification organization.
2. The appliance shall have a manufacturers' nameplate.

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3. The power supply cord shall be in good condition and shall not be worn, frayed, damaged, spliced or defective.
4. A method to disconnect the appliance shall be available.
5. The area around an appliance shall be free of fire hazards.
6. A GFCI protected circuit shall be used for appliances per the requirements of local regulations or consensus standards.
7. All cord and plug connected vending machines manufactured or re-manufactured on or after January 1, 2005 will include a ground fault circuit-interrupter as an integral part of the attachment plug or located in the power supply cord within 12 inches of the attachment plug or connected to a GFCI protected outlet as per NEC Code reference 422.51.

G. Ground-Fault-Circuit-Interrupters (GFCI)

(See Attachment “H” GFCI Template for testing and inspection information)

1. Each location shall conduct a survey to determine, per local regulations or consensus standards, all circuits requiring the installation of GFCIs.
2. Anytime an extension cord set is used, the extension cord set shall be protected by a GFCI.
3. GFCIs shall be used anytime extension cord sets are used for construction or maintenance tasks.
4. Portable GFCIs used in construction and maintenance activities shall be inspected and tested prior to each use. Any damaged GFCIs shall be immediately removed from service.
5. Permanently mounted GFCIs, shall be inspected on a quarterly basis and/or according to the manufacturer’s instructions. The results of these inspections will be documented.
6. A portable GFCI shall be plugged directly into a receptacle and an extension cord shall be plugged into the portable GFCI. Ensure that hands are not wet when plugging or unplugging cords.
7. Ground fault circuit interrupters (GFCIs), low voltage, and/or double-insulated tools will be used in construction and wet locations and on all extension cord fed portable power tools.

H. Battery Charging Stations

1. Substation battery charging stations shall be located and designed to ensure that hazards due to fire, electric arc flash, maintenance tasks and health risks

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are minimized. Charging station's electrical wiring and connections shall comply with local regulations or consensus standards.

2. Signs shall be posted to warn of hazards located at battery charging stations.
3. PPE that shall be worn while performing battery maintenance tasks include safety glasses, face shield, chemical resistant gloves, apron and protective overshoes.

I. Control Houses, Motor Control Centers, & Etc.

1. If exposed, energized parts are present, Control Houses and Switchgear Facilities shall be locked. Access to Control Houses, Motor Control Centers and Switchgear Facilities shall be controlled to prevent entrance by untrained persons. No exposed, energized parts are allowed in areas accessible to the general plant population.
2. Control Houses, Motor Control Centers and Switchgear Facilities shall be kept free of debris. Only materials and equipment necessary for electrical system repair and maintenance (R & M) may be stored in Control Houses, Motor Control Centers and Switchgear Facilities. Those storage locations established for electrical system R & M materials shall be specifically identified, approved, and periodically inspected.
3. Materials and equipment are not to be stored in front of electrical equipment. For the distance from the front of electrical equipment to ban storage of materials and equipment, see the requirements of local regulations or consensus standards.

J. Wiring and Power Cords

1. Strain relief shall be provided where cables or cords may transfer pulling forces to terminal screws or connections.
2. Electrical power cords shall not be placed across walkways or in aisles or other areas used for mechanical equipment or vehicles unless they are protected from damage and do not create slip, trip, and fall hazards. Protect extension cords from pinch points and sharp corners.
3. Cords should be suspended by non-conductive means so that they do not present trip hazards or are exposed to vehicle drive-over damage.
4. Not more than 1 additional adapter per duplex outlet may be used.
5. Do not use insulated cables as mechanical supports for people, scaffolding, ladders, or tool rests.

K. Test Equipment

All electrical test equipment used at the location will be approved by the **on-site Electrical General Foreman**. The use of voltage indicator devices ("tick sticks", etc.) is restricted to circuit identification only and will not be used for verification prior to servicing electrical circuits.

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A visual inspection of the test equipment shall be performed prior to each use to ensure that it is in good working condition and that it has the proper rating for the tests to be accomplished. Periodic inspection of electrical test equipment shall be conducted according to the manufacturer's recommendations.

L. Signage

Signs provide information regarding a potential electrical shock hazard. They are also used to display information regarding operation and/or maintenance details. The basic requirement for signs are as follows:

1. The sign shall be made of a durable material consistent with the anticipated environmental conditions and expected length of exposure.
2. The color and shape of the sign shall be consistent with regulatory requirements.
3. The lettering shall be large, highly visible, and easily seen in darkened, low-light situations.
4. Signs of warning/information are required at the following locations:
 - Electrical equipment that has unusual safety risks or is not typical of the location's electrical systems.
 - On all doors to switchgear facilities, control houses and electrical rooms.
 - Where a low voltage bus is supplied from two or more sources creating a backfeed opportunity to the low voltage supply system.
 - If temporary alterations made to the low voltage supply system may backfeed the low voltage supply system.
 - All equipment and devices shall be properly identified with easy-to-read lettering.

IX. Inspections

(See Attachments H & I for Sample Inspection Programs)

- A. All cords, plugs, receptacles, electric tools, and equipment shall be visually inspected before each day's use for damage and defects.
- B. Portable power tools, extension cords, and power strips will be inspected quarterly with the results documented.
- C. Do not use defective equipment until repaired.
- D. Upon inspection, if damage or defect is found, place a defective tool/material warning tag on the cord or tool and take the equipment to the maintenance department.
- E. An inventory of power tools, extension cords, and power strips shall be maintained.
- F. All power tools, extension cords, and power strips will be inspected periodically with this effort documented.
- G. Double insulated power tools will be resistance tested semi-annually.

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- H. Electrical test records shall be kept for the life of the equipment or for a period of 3 years.
- I. Portable GFCIs used in construction and maintenance activities shall be inspected and tested prior to each use. Any damaged GFCI shall be immediately removed from service.
- J. For permanently mounted GFCIs, a process shall be created and implemented to periodically inspect according to the manufacturer's instructions. The results of these inspections will be documented. **(See Attachment "I" GFCI Template for testing and inspection information)**

X. Predictive/Preventive Maintenance Program

- A. Critical electrical equipment shall be covered under **the Client's** documented predictive/preventive maintenance program.
- B. The PM **Client's program should** cover Transformer Oil Gas Analysis (TOGA), infrared scanning, Megger Testing, insulation resistance testing, outside electrical lines, metal-clad switchgear, metal-enclosed switches, insulated arrestors, insulated conductors, air break motor starters, 600 volt or greater switchgear, 250-600 volt switch and distribution panels, molded case breakers, protective relays, lighting panels, grounding systems, rectifiers, breaker and MCC cleaning, and bus bar connection inspections.
- C. Equipment selected and the frequency of inspection will be determined by the Client.

XI. Training

A. General

- 1. All employees will be trained in the recognition of safe and unsafe electrical conditions.
- 2. Training includes the contents of this program and in the electrical safety-related work practices that pertain to their respective job assignments.
- 3. All employees will receive awareness training annually or as required by observations showing a lack of understanding.
- 4. Annual refresher training in the understanding of an Arc Flash Assessment Sticker.
- 5. Training of personnel exposed to arc flash hazards will include the following: identifying potential arc flash hazard tasks and locations, safe work practices necessary to eliminate injury from arc flashes, and on the use and care of PPE. This training is to be done initially and once every two years.

B. Qualified Persons

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Periodic refresher electrical training (NEC and safety) will be conducted and documented of employees who are qualified to work on electrical systems every two years

The training required by this standard can be either classroom or on the job. For simple circuits or equipment, training can be as basic as discussing the hazards present on a piece of equipment and demonstrating appropriate techniques. Training may also be significantly more in depth, including classroom training, if the system or equipment to be worked on is sufficiently complex and/or the hazards are significant.

Qualified Training will consist of:

- Skills and techniques needed to distinguish exposed, energized parts from the non-energized parts of structures and other items in the environment.
- Skills and techniques needed to determine the nominal voltage of exposed live parts.
- Knowledge and understanding of the required distances that must be maintained from low voltage parts.
- Proper use of personal protective equipment, insulating and shielding materials, and insulated tools associated with working on or near exposed parts of electrical equipment.
- Skills and techniques needed to understand induced and static voltages, grounding integrity, and electrical equipment.
- Location-specific skills and rules required of qualified persons.
- Skills and techniques needed to understand the Electrical Arc Flash Hazard Boundary for low voltage equipment.

C. Non-qualified Persons

Non-Qualified Training will consist of:

- The ability to recognize potentially hazardous energy and its potential impact on workplace conditions.
- Skills and techniques needed to distinguish exposed, energized parts from the other parts of electrical equipment and how to work safely around them.
- Knowledge and understanding of the required distances to be maintained including the Electrical Arc Flash Hazard Boundary and Limited Approach Boundary.

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XII. Subcontractors

- A. Subcontractors are required to comply with all applicable OSHA Standards, NFPA 70 and the NFPA 70E.
- B. Subcontractors shall train their employees that will be working with/on/around electrical equipment in the hazards associated with electrical tools, cords, arc flash and equipment and the protective measures that must be taken.
- C. Subcontractors shall comply with the requirements of Contractor Safety Practices, concerning electrical safety.
- D. Subcontractors are required to furnish their employees that perform electrical work with the appropriate arc flash PPE requirements found in the NFPA 70E and to require this equipment to be utilized. In the event an electrical panel is not labeled with the arc flash information, the job will be stopped and the **on-site Electrical General Foreman** will be notified. The job will not proceed until the arc flash information has been provided and the appropriate PPE has been secured.
- E. Subcontractors have the responsibility to ensure their employees are properly isolating electrical circuits prior to installing, servicing, or maintaining. Questions concerning proper isolation procedures should be directed to the **on-site Electrical General Foreman**.

XIII. References:

- OSHA Standards 1910 and 1926
- National Electric Code (NFPA 70)
- NFPA 70E

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Appendix A - Typical Electric Shock Hazards

| UNSAFE PHYSICAL CONDITIONS | CONTROL MEASURES |
|---|---|
| WORN INSULATION ON EXTENSION AND DROP CORDS. SPLICES IN CORDS, BRASS SOCKETS ON DROP CORDS, OR TEMPORARY LIGHTS. | Install a system of inspection and preventive maintenance to uncover dangerous conditions and to correct them. Use Underwriters Laboratories Inc. approved materials only. Spliced cords should be removed from service. Brass sockets should be replaced with nonconductive sockets. |
| OPEN SWITCHES AND CONTROL APPARATUS ON PANEL AND SWITCHBOARDS. LOCATION OF MACHINE SWITCHES. | Provide enclosed safety switches. Insulate with rubber mats in front of switch and control equipment. Locate machine switches so as not to create hazard to the employee. |
| UNSAFE WIRING PRACTICES, SUCH AS USING WIRES TOO SMALL FOR THE CURRENT BEING CARRIED; OPEN WIRING NOT IN CONDUIT; TEMPORARY WIRING; WIRING IMPROPERLY LOCATED. | Comply with recognized electric code. Remove temporary wiring as soon as it has served its purpose. |
| EXPOSED CONDUCTORS AT REAR OF SWITCHBOARD. | Enclose rear of switchboard to prevent exposure of unauthorized persons. Provide rubber mats for workers who must enter the enclosure. |
| THE ACCIDENTAL ENERGIZING OF NON-CURRENT-CARRYING PARTS OF MACHINES AND TOOLS BY MEANS OF SHORT CIRCUITS, BREAKING IN INSULATION, ETC. | Properly ground all noncurrent carrying metal parts of machine, tools, and frames of control equipment. |
| ABUSING ELECTRICAL EQUIPMENT AND POOR HOUSEKEEPING CONCERNING ELECTRICAL EQUIPMENT. | Institute safe-work practices and inspection and preventive maintenance of equipment. Improve housekeeping practices. |
| REPLACING FUSES BY HAND ON LIVE CIRCUITS. | Open switch before replacing fuses, use fuse pullers. |
| WORKING ON HOT LOW- | Educate and train workers in the hazards of |

VOLTAGE

Revised 02/01/2024

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| UNSAFE PHYSICAL CONDITIONS | CONTROL MEASURES |
|---|--|
| CIRCUITS IN THE BELIEF THAT THEY ARE NOT HAZARDOUS. WORKING ON HOT CIRCUITS THAT ARE THOUGHT TO BE COLD. | low-voltage currents. Require that all circuits being worked on be locked open and properly tagged. Use protective equipment such as rubber gloves, blankets, etc. |
| USING 120-VOLT LIGHTING CIRCUITS FOR WORK IN BOILER OR OTHER SIMILAR ENCLOSURES. | Use low-voltage circuits. |
| OVERLOADING CIRCUITS BEYOND THEIR CAPACITY. | Lock fuse boxes to prevent bridging or replacing with heavier fuse. |

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Attachment B

ELECTRICAL SAFETY RELATED WORK PRACTICES TRAINING LOG FOR QUALIFIED EMPLOYEES

Company: _____

Address: _____

Trainers Name: _____

Date of Training: _____

Title: _____

| Employee Name | Employee # | Department | Employee Signature |
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Use a separate training log for each lesson. Employees attending the lesson should signify their presence with their signature. Note absentees, and schedule makeup classes. Attach a training agenda to this log for verification of training content.

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Attachment C

ELECTRICAL SAFETY RELATED WORK PRACTICES TRAINING LOG FOR NON-QUALIFIED EMPLOYEES

Company: _____

Address: _____

Trainers Name: _____

Date of Training: _____

Title: _____

| Employee Name | Employee # | Department | Employee Signature |
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Use a separate training log for each lesson. Employees attending the lesson should signify their presence with their signature. Note absentees, and schedule makeup classes. Attach a training agenda to this log for verification of training content.

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Attachment D

**Subject: Preventive Maintenance - Electrical
System Inspection And Test Program**

No.

**Prepared by:
Approved by:**

**Prepared Date:
Review Date:
Revised Date:**

I. SCOPE

Loss experience indicates that proper maintenance of electrical equipment would prevent about one of every ten industrial fires. Inspection and control programs can also eliminate potential hazards in the operations, maintenance, and repair of electrical systems in plants. The following guidelines and schedule include most of the items required in a good preventive maintenance program for electrical systems. A record of all tests should be maintained to develop a base for scheduling subsequent testing and for predicting failures.

II. NONROTATING ELECTRICAL APPARATUS, CIRCUIT BREAKERS, AND TRANSFORMERS (GENERAL)

A. Main Switchgear (Test once every three years)

All main switchgear should be cleaned, inspected, and calibrated. Relays should be tested for operation at proper values with multi-amp or similar equipment and contacts inspected for proper wipe, alignment, resistance, and over travel. All connections should be checked for tightness, and insulation inspected for evidence of deterioration.

B. Circuit Breakers (Test once every three years)

1. Plants should prepare a one-line diagram with conduit, wire, and breaker sizes.
2. A specification (Exhibit A) should be prepared if testing is to be performed by an outside contractor.
3. Where several breakers of one type are in use, a spare breaker should be maintained to permit in-house maintenance and repair. If no spare breaker is available at the plant site, emergency preplanning should be considered to determine availability from suppliers.

C. Transformers

(See separate template on Transformers)

D. Critical Feeders (Test every two years)

Critical feeders should be subject to dielectric tests when inspected.

E. Buss Ducts and Bars (Inspect every three years)

Inspect for loose connections and re-torque bolts to correct level as required.

III. Specific Equipment Requirements

The attached schedule (Schedule I) concerning inspection and testing of electrical systems should be used by each facility in developing their own in-house program. Infrared scan surveys and transformer oil testing are also available for units 5,000 KVA and above through insurance companies.

EXHIBIT A

TESTING AND INSPECTION OF CIRCUIT BREAKERS

A. GENERAL

1. Provide all labor, materials, and instruments as required for complete testing and inspection of circuit breakers as shown on Drawings EE-1, EE-2, and as hereinafter described.
2. All work shall be done at hours as directed by the owner.

B. TESTING AND INSPECTION

1. Manually and visually inspect contacts, clearances, tightness, and operation of breaker.
2. Test each breaker for proper automatic operation both during overload and short circuit conditions. Percentage of the breaker trip setting current to be used for testing purposes shall be as recommended by the breaker manufacturer.
3. Check breaker contact point resistance.
4. Test and inspection results shall be recorded covering the condition and operating status of each breaker along with suggested corrective actions such as adjustments, maintenance, replacement or upgrading, etc., as required to achieve proper performances.

C. CIRCUIT BREAKERS TO BE TESTED ARE AS FOLLOWS

| <u>MDB or Unit Sub.</u> | <u>Ckt Breaker</u> | <u>Frame</u> | <u>Trip</u> | <u>Type of C.B.</u> |
|----------------------------------|--------------------|--------------|-------------|---------------------|
| <u>MDB A</u> (120/208V-30-4W) | MCB | 5,000 | 5,000 | Air C.B. |
| | A-1 | 1,600 | 800 | Air C.B. |
| | A-2 | 1,600 | 800 | Air C.B. |
| | A-3 | 1,600 | 800 | Air C.B. |
| | A-4 | 1,600 | 1,200 | Air C.B. |
| | A-5 | 1,600 | 1,200 | Air C.B. |
| | A-6 | 600 | 400 | Air C.B. |
| | A-7 | 600 | 600 | Air C.B. |
| | A-8 | 800 | 800 | Molded Case C.B. |
| | A-9 | 800 | 800 | Molded Case C.B. |
| | A-12 | 1,200 | 1,200 | Molded Case C.B. |

ELECTRICAL WORK

| <u>MDB or Unit Sub.</u> | <u>Ckt Breaker</u> | <u>Frame</u> | <u>Trip</u> | <u>Type of C.B.</u> |
|------------------------------|--------------------|--------------|-------------|---------------------|
| <u>MDB B</u> | | | | |
| (120/208V 30 4W) | MCB | 3,000 | 2,500 | Air C.B. |
| | B-1 | 600 | 600 | Molded Case C.B. |
| | B-2 | 400 | 400 | Molded Case C.B. |
| | B-3 | 225 | 225 | Molded Case C.B. |
| ----- | | | | |
| <u>MDB C</u> | | | | |
| (227/480v-30-4W) | MCB | 5,000 | 5,000 | Air C.B. |
| | C-1 | 600 | 600 | Air C.B. |
| | C-2 | 600 | 600 | Air C.B. |
| | C-3 | 800 | 800 | Molded Case C.B. |
| | C-4 | 800 | 600 | Air C.B. |
| | C-5 | 600 | 600 | Air C.B. |
| | C-6 | 600 | 600 | Air C.B. |
| | C-7 | 600 | 600 | Air C.B. |
| | C-8 | 600 | 600 | Air C.B. |
| | C-9 | 600 | 600 | Air C.B. |
| | C-10 | 400 | 350 | Molded Case C.B. |
| | C-11 | 400 | 400 | Molded Case C.B. |
| ----- | | | | |
| <u>Unit Sub. D.</u> | | | | |
| (277/480V-30-4W) | MCB | 1,600 | 1,200 | Air C.B. |
| | D-1 | 225 | 150 | Molded Case C.B. |
| | D-2 | 400 | 400 | Molded Case C.B. |
| | D-3 | 400 | 400 | Molded Case C.B. |
| | D-4 | 225 | 150 | Molded Case C.B. |
| | D-5 | 225 | 125 | Molded Case C.B. |
| | D-6 | 225 | 200 | Molded Case C.B. |
| ----- | | | | |
| <u>Sewage Treatment Plan</u> | | | | |
| ----- | | | | |
| <u>Protectal</u> | | | | |
| <u>Control PNL</u> | MCB | 400 | 350 | Molded Case C.B. |
| ----- | | | | |
| <u>PHV</u> | MCB | 100 | 95 | Molded Case C.B. |
| ----- | | | | |

CLEANING AND REPAIR

A. GENERAL

1. Based on the test and inspection results provide all labor and materials as required to repair faulty equipment and clean equipment as hereinafter described.
2. Work shall be done by an electrical contractor as directed by the owner under the supervision of the testing contractor.

B. LARGE AIR CIRCUIT BREAKERS

5000/5000 main air circuit breaker in MDB A
3000/2500 main air circuit breaker in MDB B
5000/5000 main air circuit breaker in MDB C

1. If test indicates faulty automatic operation of breakers, remove overload and short circuit protection as required and use breaker as a non-automatic disconnect device.
2. Faulty mechanical draw-out mechanism shall be repaired immediately to permit closing of breaker.

C. CIRCUIT BREAKERS

For all circuit breakers to be tested with trip setting 1200A and below, do as follows:

1. Replace faulty air circuit breakers with molded case circuit breakers with same trip setting if parts for repair are not available. Molded case circuit breakers shall be "hard wired" to buss behind breaker compartment door.
2. Replace faulty molded case circuit breaker trip elements as required.

D. CLEANING

1. For all circuit breakers listed to be tested clean all contact points, frames, compartment, and copper buss of all dust, dirt, carbon, moisture, and other extraneous material.
2. Adjust and lubricate air breaker draw-out mechanism.

E. MISCELLANEOUS

1. The contractor shall indicate unit price for complete replacement of air breakers with molded case circuit breakers as follows:

E. MISCELLANEOUS (cont)

| <u>MOLDED CASE CIRCUIT BREAKER</u> | | | | |
|------------------------------------|-------|-------|-------|--------------------------------------|
| FRAME | TRIP | POLES | VOLTS | INT. RATING AT 240V RMS SYS. AMPS |
| 1,200 | 1,200 | 3 | 600 | 65,000 |
| 1,200 | 1,200 | 3 | 600 | 65,000 |
| 800 | 800 | 3 | 600 | 65,000 |
| 600 | 600 | 3 | 600 | 65,000 |
| 400 | 400 | 3 | 600 | 65,000 |
| 400 | 350 | 3 | 600 | 65,000 |
| 400 | 300 | 3 | 600 | 65,000 |
| 400 | 225 | 3 | 600 | 65,000 |
| 400 | 200 | 3 | 600 | 65,000 |
| 400 | 125 | 3 | 600 | 65,000 |

2. The contractor shall arrange with the supplier of molded case circuit breakers for immediate delivery of replacement breakers as required by the test.

SCHEDULE I

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OUTSIDE ELECTRIC LINES

| INSPECTION | | INTERVAL |
|---|--|--|
| Patrol lines and inspect following parts: (Use binoculars where necessary) | | 4 to 6 months |
| 1. Poles for: a. Leaning b. Washout around base c. Splitting d. Woodpecker holes e. Lightning damage (also soon after an outage during a lightning storm) | | |
| 2. Crossarms for: a. Twisting b. Splitting c. Decay d. Loose or missing braces e. Loose pins f. Tracking or burning | | |
| 3. Guys and Anchors for: a. Broken strands b. Corrosion c. Looseness and slippage d. Adequate clearance from conductors e. Loose clamps f. Anchor eye above ground | | |
| 4. Insulators and Bushings for: a. Cracks (careful inspection) b. Chips or bad breaks c. Unscrewed d. Leaning at bad angles e. Cleanliness | | |
| 5. Lighting arrestors for: a. Breaks, cracks, and chips b. Ground connection | | |
| NOTE: If atmosphere is contaminated with conducting material it might be necessary to clean and coat porcelain surfaces with silicon annually/biannually. | | |
| 6. Conductors for: a. Broken strands b. Blisters or burned spots c. Excessive/uneven sagging d. Loose connections e. Horizontal & vertical clearances f. Trees that touch or can fall across lines | | |
| 7. Hardware for: a. Looseness b. Corrosion | | |
| 8. Ground wires for: a. Breaks b. Attachment to pole | | |
| Making climbing inspection of poles for detailed observations of above. Tighten hardware and make repairs found necessary. An aerial bucket truck is especially adapted for pole-top inspections and repairs. | | 3 to 5 years |
| Make ground line and above ground inspection of wood poles. Sound, test bore, inspect to 20" below ground and treat with preservative. Above ground wood preservative treatment may be necessary. Inspect for: a. External decay below ground b. Above ground and roof decay c. Hollow heart rot d. Shell rot e. Crossarm decay f. Termites | | 8 to 10 years in Southern states. 10 to 12 years in Northern states. |

NOTE: Conduct DC high-potential proof test on lines to detect failures that are not apparent by visual inspection. Measure ground resistance every 3 to 5 years.

5-15 KV METAL-CLAD SWITCHGEAR (INCLUDES 2.3 KV)

| TYPE | INSPECTION AND TESTS | INTERVAL |
|---------|--|---|
| Indoor | Visual inspection of parts made accessible by opening external doors; i.e., fronts of breakers, rear of meters and relays, terminal blocks, wiring, space heaters (See Note 1) and other electrical parts. Inspect for cleanliness, tracking, evidence of water, rodents, and reptiles. See Note 3. | 3 to 6 months |
| | Complete cleaning and detailed inspection of all parts including circuit breakers, breaker disconnect studs, insulators, cable terminations connections, loose bolts (See Note 2) and other electrical parts. Tests with Biddle Ducter, or equivalent, to determine breaker contact resistance. Test buses, breakers, PT's, CT's and cables with high potential DC. Test transformers and protective relays. | At installation, annually for 2 years after installation, then 3 to 6 years, depending upon ambient conditions. (Shutdown is required). |
| Outdoor | Visual inspection of parts made available by opening external doors; same as for indoor gear above and for evidence of condensation, water leaks, rodents and reptiles. Check air filters for cleanliness (clean or renew). See Note 1. | 3 months |
| | Complete cleaning and detailed inspection of all parts; same as for indoor gear above. Test buses, breakers, PT's, CT's cables, etc. with high potential DC. Test transformers and protective relays. | At installation, annually for 2 years after installation, then every 3 years. (More often if conditions require. Shutdown is required) |

Note 1. Space heaters are required in switchgear located outdoors and in unheated indoor areas. They should be operated continuously.

Note 2. Check connection bolts for tightness as soon as possible (not over 6 months) after normal load applied.

Note 3. Visually inspect cable terminations for cleanliness and tracking at least once a year.

5-15 KV METAL ENCLOSED SWITCHES (INCLUDES 2.3 KV)

| TYPE | INSPECTION AND TESTS | INTERVAL |
|---------|---|---|
| Indoor | Visual inspection of interior through inspection windows (if provided) for cleanliness, evidence of condensation, water leaks, rodents and reptiles, (same as for metal-clad switchgear). See Notes 1, 2, and 3. | 3 to 6 months |
| | Complete cleaning, detailed inspection and DC high-potential tests; (same as for metal-clad switchgear). | At installation, annually for 2 years after installation, then 3 to 6 years (Shutdown is required). |
| Outdoor | Visual, same as for indoor type above and for evidence of condensation, water leaks and rodents. Check air filters for cleanliness (clean or renew). See Notes 1, 2, and 3 | 3 months |
| | Complete cleaning and detailed inspection and test, (same as for metal-clad switchgear). Check air filters for cleanliness (clean or renew). | At installation, annually for 2 years after installation, then every 3 years. More often if conditions require. (Shutdown required) |

Note 1. Space heaters are required in switchgear located outdoors and in unheated indoor areas. They should be operated continuously.

Note 2. Check connection bolts for tightness as soon as possible (but not more than 6 months) after normal load is applied.

Note 3. Visually inspect cable terminations for cleanliness and tracking at least once a year.

3-15 STATION AND ROTATING MACHINE TYPE LIGHTING ARRESTERS

| TYPE | INSPECTION AND TESTS | INTERVAL |
|---------|--|--|
| Indoor | Clean, inspect and test at same time as associated switchgear, cables and transformers. Dirt collects on interior surfaces of unsealed-type arresters and lowers resistance values. When this occurs, disassembly and cleaning is necessary. Test resistance with 2500-volt megger or DC high-potential test set. Conduct a power factor test on unsealed type arresters rated 15 KV and above. | 3 to 6 years (Shutdown required). |
| Outdoor | Same as indoor arresters above. Outside and dirt deposits usually are more severe in outdoor arrestors than for indoor arresters. | 3 years or more often, depending on ambient conditions and amount of deposit on porcelain surfaces (Shutdown is required). |

3-15 KV INSULATED CABLES (ALSO 600-VOLT MAIN FEEDERS)

| TYPE | INSPECTION AND TESTS | INTERVAL |
|--|---|--|
| Indoor outdoor, underground, in conduit, in tray, in duct and direct burial. | Visual inspection of cables at conduit ends splices, supports and poles for deformation due to pressure. Visual inspection of PILC cable at same points for oil or compound leaks. Visual inspection of terminations for dust, tracking, deformation, water streaks, and being too close to grounded metal parts. | 1 year |
| | Complete inspection same as above, cleaning of terminations and DC high-potential testing. | At installation, annually for 2 years after installation, then every 6 years and full maintenance test voltages. Or, every 2 years at reduced maintenance test voltages. (Shutdown is required.) |

AIR-BREAK MOTOR STARTS (2.4 AND 5KV)

| TYPE | INSPECTION AND TESTS | INTERVAL |
|------|---|-------------------------------------|
| | Same as 600-volt starters, except test insulation with 2500-volt megger or equal. If starter is equipped with induction type relays, test with Multi-Amp relay test set. See Notes 1, 2, and 3 of AIR-BREAK MOTOR STARTERS AND CONTROL CENTERS (600 V AND BELOW) page 13. | 1 to 3 years (Shutdown is required) |

LOW-VOLTAGE SWITCH (600 V AND BELOW)

| TYPE | INSPECTION AND TESTS | INTERVAL |
|---------|---|--|
| Indoor | Visual inspection of parts made accessible by opening front and rear doors; i.e., fronts of breakers, rear of meters and relays, terminal block, wiring buses, and insulators. Inspect for cleanliness and evidence of water and rodents. Visual inspection of dashpots on overcurrent trip devices for oil leakage. Check for proper operation of space heaters in unheated areas. (See Note 3) | 3 to 6 months |
| | Check CT wiring by means of ammeter switch where available. Inspect bus joints and cable terminals for evidence of heating. (See Notes 1 and 4) | |
| | Complete cleaning and detailed inspection of all switchgear structures, including circuit breakers, wiring buses, disconnect devices and insulators. Test with 2500-volt megger. Check bus and cable joints for tightness. | At installation and 3 to 6 years thereafter (depending on ambient conditions. Shutdown is required) |
| | Detailed inspection and cleaning of power air circuit breaker units and calibration and testing of overcurrent trip devices with Multi-Amp Co. test equipment (see Note 5). Test with 2500-volt megger, Biddle Ducter or equivalent to determine contact resistance. Annual functional trip testing of power air circuit breakers is highly desirable to determine if binding parts or defective wiring would prevent a breaker from tripping open to clear a fault or overload condition. | At installation, 1 year after installation and 3 years thereafter, and after breaks open under fault conditions. (Shutdown of affected feeds is required). |
| Outdoor | Visual inspection of parts made accessible by opening external doors; same as for indoor type above. Look for evidence of condensation, overheating, water leaks, rodents and reptiles. Check for unsealed underground conduits that can be a source of vapor. Check air filters for cleanliness (clean or renew). Check space heaters that should operate continuously. Inspection after prolonged rain is preferred to locate leaks. Inspect overhead cable entrances for water leaks. Inspect cable terminals for evidence of water running through conductors from connection on overhead lines, that is often the point of entry | 3 months |
| | Complete cleaning and detailed inspection of all switchgear structures, including circuit breakers, same as for indoor type above. | 3 years. (More often if environmental conditions require) (Shutdown is required) |
| | Detailed inspection, cleaning and testing of circuit breaker units (same as for indoor gear above). | At installation, and 3 years thereafter. Also after break opens under fault conditions. (Shutdown on affected feeder is required) |

LOW-VOLTAGE SWITCHGEAR (600 V AND BELOW)

Notes 1 through 5

Note 1. Heating of cable terminals often is encountered in low-voltage switchgear. This is caused by loosening of connections due to cold flow and distortion of the copper or aluminum and load cycling. Experience indicates that tightening bolts and connectors after total load has been applied for several months should be shut down at intervals of no more than 6 months of operation so all bus joint bolts and cable terminals can be tightened.

Note 2. A high incidence of molded case circuit breaker failure from overheating of terminals and contacts has occurred. Feeling upper portion of breaker enclosure with hand will detect overheating condition. Maximum interval of one month recommended; weekly interval desirable. This can be done by personnel when in area for other tasks.

Note 3. Space heaters are required in switchgear located outdoors and in unheated indoor locations. They should operate continuously.

Note 4. Portable infra-red thermometer may be used to check connection temperature without de-energizing.

Note 5. Overcurrent trip devices should be tested and calibrated by competent and adequately trained personnel who perform this work at frequent intervals so as to remain fully acquainted with the details of testing and calibration.

AIR-BREAK MOTOR STARTERS AND CONTROL CENTERS (600 V AND BELOW)

| TYPE | INSPECTION AND TESTS | INTERVAL |
|------|---|---|
| | Visual inspection of individual starter interiors and mechanism for cleanliness, terminal tightness, contact burning, overheating fuses, evidence of condensation, water leaks, rodents and overheating of main switch and terminals (see Notes 1 and 2). Test load and control wiring with 1000-volt megger. Note: Feeling upper portion of an operating starter enclosure with hand every 3 months, or more often, is a good method for detecting overheating of main switch or breaker. | 1 year. More often if conditions require. (Shutdown of individual starters is required) |
| | Complete cleaning and inspection of main buses, switch, contacts, terminals and wiring. Test insulation with 1000-volt megger or equal. Test overload relays with Multi-Amp Jr. overload relay tester or equivalent. | 3 to 6 years. (Shutdown of MCC or starter rack required) |

Note 1. Space heaters are required in motor control centers located outdoors and in unheated indoor areas. They should be operated continuously.

Note 2. Check connection bolts for tightness as soon as possible (but not more than 6 months) after total load is applied.

Note 3. Visually inspect shielded cable terminations for cleanliness and tracking at least once a year.

250-600 VOLT SAFETY SWITCHES AND DISTRIBUTION PANELS

| TYPE | INSPECTION AND TESTS | INTERVAL |
|---------|--|--|
| Indoor | <p>Feel switch enclosures with hand to detect overheating. If overheating is detected, determine load. If overloaded, reduce load, repair switch or install larger switch or wire (or both) if required.</p> <p>Note: If overhead switch is not overloaded (a load greater than 80% of nameplate ampere rating) de-energize switch and inspect fuses, fuse clips, and terminals for tightness. If spring clips have lost their temper, replace same. Tighten high bolts and clean all joints and clips. Apply a thin coat of good general purpose lubricant to metal parts only (not on insulation). Operate switch several times before replacing in service. Test with Biddle Ducter, or equivalent to determine contact resistance.</p> | 3 years or more often, (Shutdown required only for corrective action). |
| | Clean, inspect and test with 1000-volt megger, or equivalent. Inspect fuses for proper type. | 3 to 6 years (Shutdown required) |
| Outdoor | Same as indoor type above. In addition, inspect for evidence of condensation and water leaks. | |

MOLDED CASE CIRCUIT BREAKERS

| TYPE | INSPECTION AND TESTS | INTERVAL |
|-------------|--|---|
| below 1200A | <p>Feel enclosures with hand for overheating.</p> <p>Note: If operating above normal temperature, check load. If overloaded, reduce load or install larger breaker and wire. If not overloaded, de-energize and repair or replace breaker. Make certain terminals are tight. (Shutdown is required.)</p> | 1 month recommended; 1 week desirable. (Can be done rapidly by personnel while in area on other tasks.) |
| | Clean and inspect breaker. Tighten terminals. Test insulation of breaker and wiring with megger or equivalent. Test overload trip elements with Multi-Amp Jr. tester or equivalent to determine contact resistance. | 3 to 6 years (Shutdown is required) |

Note: Molded circuit breakers should be replaced when they have operated under a fault condition with a magnitude of within 80% of their rated I.C. capacity.

PROTECTIVE RELAYS

| TYPE | INSPECTION AND TESTS | INTERVAL |
|-------------------------------------|--|---|
| Over-current potential differential | <p>Visual inspection for proper operation and calibration. Calibration and test with Multi-Amp Company or similar relay test equipment.</p> <p>Make functional proof test of relay and wiring with phantom load to trip associated circuit breaker on annual basis, if possible. This is of special importance on 600-volt power air circuit breakers.</p> <p>See Note below</p> | 3 years. More often where dust, moisture, corrosion, vibration, or wide variations in temperature are present. Tripping of breaker will shut down loads connected thereto, unless alternate supply breaker is provided. |

Note: Relays should be tested and calibrated only by competent and adequately trained personnel who perform this type of work at frequent intervals.

LIGHTED PANELS

| TYPE | INSPECTION AND TESTS | INTERVAL |
|------|--|-----------------------------|
| | Visual external inspection and feel covers of switches and breakers for overheating. | 6 months |
| | Check panel directory for condition and completeness. | |
| | <p>Complete cleaning and inspection of interior. Tighten terminals. Test insulation with 500-volt megger or equal. Test branch breakers with Multi-Amp Jr. tester or equivalent. Check panel directory for accuracy; replace if necessary.</p> <p>Rearrange disorderly wiring.</p> | 6 years (Shutdown required) |

GROUNDING SYSTEMS

| TYPE | INSPECTION AND TESTS | INTERVAL |
|---------------------------------------|--|--|
| Electric system, lighting and static. | <p>Inspect for loose connections and breaks. Test with ground megger.</p> <p>Check panel directory for condition and completeness.</p> | 6 to 12 months. (Shutdown required in hazardous areas.) |
| Vault return | Inspect for loose connections and breaks. | 12 months |
| | Test with Ductor or equivalent. | 3 to 6 years. (Shutdown required for Ductor testing in hazardous areas.) |

Attachment E High Voltage Supplement

1. For any new or upgraded high voltage installations, location management ensures that the applicable National Electric Code requirements are followed for installations that affect the high voltage systems such as only using insulated cable and arc-resistant switchgear with integral grounding.
2. The On-Site Manager is responsible for ensuring that all applicable requirements of OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, and NFPA 70E are followed. (Note: The location manager may appoint a qualified person as a NFPA 70E designee to manage the responsibilities of this document on his/her behalf, excluding the following specific responsibilities: Approving live-line work; permitting un-insulated mobile equipment to enter the Restricted Approach Boundary for testing and grounding of exposed, energized parts. **Please see the Energized Electrical Work Permit in Attachment F.**
3. The Electrical General Foreman (NFPA 70E designee) approves all new designs and modifications to the high voltage system(s).
4. The Electrical General Foreman (NFPA 70E designee) conducts a high voltage electrical audit of the system prior to performing any work.
5. The location develops a procedure for creating a safe work zone. This procedure is utilized when working on, testing, or preventing access to any high voltage source. The procedure details the steps for: Isolating and confirming isolation of energy sources; tagging and locking energy sources; testing (verifying if safe to apply grounds) and grounding energy sources; identifying the safe work zone; documenting that the safe work zone is established; and releasing the safe work zone (restoring power). Any live line work and the accompanying Job safety Analysis is approved by the location manager. Procedures for live work will be documented as per Attachment F of this document.
6. All J. J. White, Inc. Electrical Personnel and subcontracted Electrical Employees (i.e., utility companies working on their owned equipment are excluded) are trained per the applicable requirements of OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, and NFPA 70E.
7. A qualified person prepares switching orders with each step clearly identified as per the applicable requirements of OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, and NFPA 70E. A second qualified person will review these orders. Switching orders will include a list of all switches and circuit breakers that will be operated for energy isolation. Each step of switching orders will be marked off as completed.
8. Signs (Labeling, Markings, Identification) are in place as required as per OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, and NFPA 70E. Signs are used to provide information regarding a potential electrical hazard and to display information regarding operations or maintenance details. The following is considered for signage:
 - a. The sign shall identify arc flash hazard, voltage, current
 - b. The sign shall be made of a durable material consistent with the anticipated environmental conditions and expected length of exposure.
 - c. The color and shape of the sign shall be consistent with regulatory requirements.
 - d. The letters shall be large, highly visible, and easily seen in darkened, low-light situations.

- e. Internationally accepted symbols should be used as much as is practical, in bi-lingual areas, both languages shall be displayed on signs
 - f. Information or warning signs shall be located at the following locations:
 - i. On all substation doors, gates, and fences.
 - ii. On all doors to switchgear rooms, or other similar compartments where exposed, energized electrical parts are located.
 - iii. On all transmission or distribution structures where affected persons or the public may be present. In the case of multi-support structures, the signs shall be located on all sides so that a sign is seen from any approach direction.
9. Storage of materials and equipment in switchyards and power system rights of-way is prohibited as per OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, and NFPA 70E. (Substation enclosures, switchgear room entrances, and other locations with exposed, energized parts shall be kept locked at all times except when work is being performed. Materials and equipment are not stored in front of high voltage distribution equipment. Substation lots and switchgear facilities shall be kept free of debris. JJ White employees shall not store material and equipment in electrical rights-of-way closer than ten feet horizontal under exposed high voltage lines. Any mobile equipment that could violate the ten-foot rule shall be prohibited from parking in this area.)
10. A documented and effective locking program to prevent unauthorized operation of high voltage switches as per Section 4.8.9 of NFPA 70E is available.
11. Specific high voltage tasks (servicing, cleaning, infrared scans, line clearing, tree trimming, etc.) are identified as per OSHA 29 CFR 1910 Subpart S, OSHA 29 CFR 1926 Subpart K, and NFPA 70E.
12. Permanent grounds are inspected annually and tested on a 5-year basis. Fences, structures, and pipelines underneath high voltage lines, are effectively grounded and bonded (i.e. fence gates) to limit touch, step, and transferred voltages. Qualified personnel conduct periodic documented inspections of substations to determine equipment condition and ground system integrity.
13. Prior to any high voltage work commencing, task supervisors conduct a pre-work briefing with involved personnel.
14. Mobile equipment operators are aware of the 10-foot rule, proper grounding techniques, Restricted Approach Boundary, and in recognizing potential electrical hazards and this is covered in their written training program. Proper grounding procedures are used for mobile equipment. For equipment hoisted over energized lines, a JSA for this task is developed and approved by the location manager.

Attachment F: Energized Electrical Work Permit

Part I: To be completed by the requester:

1. Description of the circuit/equipment/job location: _____

2. Description of work to be done: _____

3. Justification of why the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage: _____

Requester/Title

Date

Part II: To be completed by the electrically qualified persons doing the work:

Condition

1. Detailed job description procedure to be used in performing the aforementioned work:
2. Description of the safe work practices to be employed:
3. Result of Shock Hazard Analysis:
4. Determination of Shock Protection Boundaries:
5. Results of the Flash Hazard Analysis:
6. Determination of the Flash Protection Boundary:
7. Necessary Personal Protective to safely perform the assigned task:
8. Means employed to restrict the access of unqualified persons from the work area:
9. Evidence of completion of a pre-job briefing:

| Check when complete |
|---------------------|
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Condition

10. Do you agree with the aforementioned work can be done safety? (If no, return to requester!)

Electrically Qualified Person(s)

Date

Electrically Qualified Person(s)

Date

| Yes | No |
|-----|----|
| | |

Part III: Approvals to perform the work while electrically energized:

Location Site Manager

Date

Location Site Safety Manager

Date

Location Electrical General Foreman

Date

Other Required Notifications:

Project Manager

☐

Date ____/____/____ Time ____:____

Corporate Safety Manager

☐

Date ____/____/____ Time ____:____

Attachment G: Electrical Safety Pre-Work Evaluation

| <u>ELECTRICAL SAFETY PRE-WORK EVALUATION</u> | | | |
|--|---|-------------|---|
| <u>BEFORE STARTING ELECTRICAL REPAIRS, USE THIS CHECKLIST TO EVALUATE SAFETY ISSUES. SUBMIT COMPLETED FORMS TO THE SAFETY DEPARTMENT ALONG WITH PERMITS & JSA</u> | | | |
| Date | | Dept | |
| Equip: | | Technician: | |
| Job Task: | | | |
| TYPE OF ELECTRICITY BEING SERVICED: 110V 220V 270V 440V 460V 480V Other: | | | |
| | If JSA is available for task, has it been reviewed? | | |
| | Have affected employees been notified of work? | | |
| Will covers be removed for power-on testing or servicing: Yes No | | | |
| Arc Flash Level: 0 1 2 3 4 Arc Flash Boundary Zone: _____ inches | | | |
| ADDITIONAL HAZARDS | | | |
| | Damp/Wet Environment | | Close Quarters |
| | Inadequate Lighting | | Slip/Fall Issues |
| | Excessive Heat/Cold | | Noise |
| | Mobile Equipment in Area | | Pedestrians in Area |
| | Other: | | |
| PPE REQUIRED | | | |
| | FR Long sleeve shirt & pants | | E rated Hard Hat |
| | Safety Glasses | | FR Face Shield |
| | Electrical Rated Gloves | | 50" FR Coveralls |
| | Switching Hood | | Flash Suit |
| | Other: | | |
| OTHER PRECAUTIONS | | | |
| | Portable Lighting | | Extension Cords/GFCI |
| | No Metal Watches, Rings, Metal Framed Glasses, etc. | | Insulating Mats, Sleeves, etc. |
| | Area Barricades | | Live Line Tools |
| | Portable Fan | | Fall Protection |
| | Fuse Pullers Dielectric Mats | | Ladder 5 KV Blankets E-Rated Hearing Protection |
| | Other: | | |
| | Are Safe Work Zone & Arc Flash Boundary established? | | |
| | Has equipment been isolated using LTV? | | |
| | Are additional isolation measures; visual check of blades, phase to phase; phase to ground checks, completed? | | |
| | Has job been divided into tasks & individual assignments completed | | |
| | Have all parties involved with job reviewed this assessment? | | |
| Comments: | | | |

Note: Please check that all certifications for PPE are current and up to date.

| ELECTRICAL PPE MATRIX | | | | | |
|---|----------------|----------------|----------------|----------------|----------------|
| Arc Hazard Level | Level 0 | Level 1 | Level 2 | Level 3 | Level 4 |
| Potential arc fault energy protection (all values are cal/cm ²) | 0 | 5 | 8 | 25 | 40 |
| Untreated natural fiber long-sleeve shirt/ | X | | | | |
| Untreated natural fiber pants | X | | | | |
| 100% cotton underwear, including short-sleeve t-shirt | | | X | X | X |
| FR long-sleeve shirt and pants | | X | X | X | X |
| Safety glasses | X | | | | |
| Safety glasses with side shields and non-metallic frames | | X | X | X | X |
| Electrically rated safety shoes | | X | X | X | X |
| Hearing protection | | | X | X | X |
| Class E 20kV hardhat | | X | X | X | X |
| Insulated gloves/leather protectors (select appropriate voltage class) | | X | X | X | X |
| FR mid-calf length smock, or coveralls – Total ATPV must be at least 8 cal/cm ² | | | X Note 1 | | |
| FR mid-calf length smock, or coveralls – Total ATPV must be at least 25 cal/cm ² | | | | X | |
| Wrap around face shield, amber tinted proportionate providing UV protection | | | X | X | |
| FR flash hood or cape | | | | X | |
| FR switcher's hood with wrap around face shield, amber tinted proportionate providing UV protection rated 50cal/cm ² | | | | | X |
| Multi-layered flash suit or jacket & pants providing ATPV of at least 40 cal/cm ² | | | | | X |

Note 1 – If FR pants and shirt provide ATPV of at least 8 cal/cm², FR smock or coveralls not required.

Attachment H: QUARTERLY PORTABLE POWER TOOL, EXTENSION CORD, AND POWER STRIPS INSPECTION FORM

| Date of inspection: | | | | | | | | | | | | | | | |
|---|--------------|----------------------|--|--|-----------------------------------|---|--|--------------------------------------|-----------------------------------|--|---|-----------------------------------|--|--|--|
| Extension Cord, Power Strip, or Tool ID # | Manufacturer | PORTABLE POWER TOOLS | | | | | | | | EXTENSION CORDS | | | POWER STRIPS | | |
| | | Double Insulated | | Non-Double Insulated | | All Tools | | | | Only industrial type extensions used? | Cord not frayed, cut, taped, or crushed? | 3-wire plug in good condition? | Casing in good/undamaged condition? | Power cord not frayed, cut, taped, or otherwise damaged? | Power On Indicator light functioning? |
| | | Double insulated? | If double insulated, has the tool been tested with insulation resistance tester? | Ground wire fastener in safe condition? | 3-wire plug in good condition? | Tool body shows no damage or cracks? | Cord insulation and plugs unbroken? | Guards used on grinders and saws? | Movable guards operate freely? | | | | | | |
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Attachment I GFCI Inspection

Subject: GROUND-FAULT PROTECTION AND INSPECTION PROGRAM

Prepared by:
Approved by:

Prepared Date:
Review Date:
Revised Date:

I. PURPOSE

The purpose of this program is to protect employees from injury due to unexpected electrical discharge from improperly grounded equipment. This program has been developed to comply with the Occupational Safety and Health Administration, 29 CFR 1926.404 and 29 CFR 1910.304, Wiring Design, and Protection.

II. SCOPE

The **ENTER FACILITY NAME** facility may work with temporary wiring or uses portable electric powered equipment, and has chosen to implement **((DELETE THE TYPE OF PROGRAM YOU ARE NOT USING AT YOUR FACILITY)) the Ground Fault Circuit Interrupter (GFCI) Program and the Assured Equipment Grounding Conductor Program.**

II. RESPONSIBILITIES

A. **ENTER NAME AND/OR JOB TITLE** is the designated **ENTER FACILITY NAME Ground-Fault Program Coordinator**, and is responsible for the following:

1. Develop and administer all aspects of the written Ground Fault Program.
2. Assure the training and issuance of proper equipment in accordance with this program.
3. Audit the program to assure compliance.

B. **Area Supervisors** are responsible for the following:

1. Attend training on ground fault protection and assure that only trained employees perform such work in their area of responsibility.
2. Assure that employees using portable equipment are also using ground fault protection.

C. **Employees** are responsible for the following:

1. Attend the required training session.
2. Follow the provisions of the Ground-Fault Program, and notify their supervisor of any problems with equipment or the program.

III. GROUND-FAULT PROGRAM

((THERE ARE TWO DIFFERENT PROGRAMS THE FACILITY MAY CHOOSE TO IMPLEMENT, THE GROUND-FAULT CIRCUIT INTERRUPTER (GFCI) PROGRAM, OR

Revised 02/01/2024

THE ASSURED EQUIPMENT GROUNDING CONDUCTOR PROGRAM. COMPLETE THE
FILL IN THE BLANK FOR THAT PROGRAM WHICH WILL BE USED AT YOUR FACILITY.
THE OTHER PROGRAM SHOULD THEN BE DELETED FROM YOUR FACILITY SPECIFIC
WRITTEN PROGRAM. YOU MAY ALSO CHOOSE TO USE BOTH PROGRAMS.))

A. The Ground-Fault Circuit Interrupter (GFCI) Program

The GFCI Program will be used at the **ENTER FACILITY NAME** facility, and requires that a GFCI is located between the power source and the tool and for all outlets subjected to potential splash from liquids (use 3-foot rule).

1. Equipment

There are a number of different types of GFCIs that can be used. The **ENTER FACILITY NAME** facility will use:

((DELETE THOSE YOU WILL NOT BE USING. ADD ANY TYPE THAT YOU DO USE, IF NOT LISTED HERE.))

- a. Purchase extension cords that come equipped with GFCIs.
- b. Purchase GFCI outlets and electrical boxes and have a certified electrician put them together and attach them to an extension cord. Employees can then plug their extension cord into the power source and plug the tool being used into the GFCI.

2. Training

Supervision or the Electrical Safety Program SPA will instruct employees on the GFCI Program in the work area. The training will cover the following:

a. The definition of a GFCI:

The GFCI is a fast-acting circuit breaker which senses small imbalances in the circuit caused by current leakage to ground, and in a fraction of a second, shuts off the electricity. GFCIs monitor the difference in current flowing into the "hot" and out to the grounded neutral conductors. The difference in current will flow back through any available path, such as the equipment grounding conductor, or through a person holding the tool if the person is in contact with a grounded object, (standing on the ground).

b. Why GFCIs are needed:

Extension cords tend to get twisted, punctured, etc. This may result in a conductor becoming exposed, allowing for the potential hazards of electrical shock, burns, or fire. The GFCI will sense the imbalance and immediately shut off the electricity to that tool, eliminating the potential hazard to the employee.

GFCIs also provide protection against fire, overheating, and destruction of insulation on wiring.

- c. The proper use, limitations, and testing of the GFCI:
1. When an employee is using temporary wiring such as extension cords in the work area, they must have a GFCI between the power source and the tool.
 2. The Office of Electrical, Electronic, and Mechanical Engineering Safety Standards does not recommend the use of GFCI testers as a means of determining compliance with OSHA regulations (i.e., §1926.404(b)(1)(ii)), as such testers may not produce accurate results. Ground-fault circuit interrupters incorporate a testing circuit that can be used to determine whether or not the device itself will function as intended. No further tests are necessary.

Any GFCI tester that puts a resistive load between the ungrounded circuit conductor and the equipment grounding conductor¹ to measure the current at which the device trips is subject to errors due to voltage fluctuations. If the circuit voltage is 100 volts, the tester could indicate that a GFCI tripped at 7.2 mA when it would actually have tripped at 6.0 mA.

Testers like the Greenlee model 5708,(2), cannot produce a reliable indication of the trip level of a GFCI. This device sends a 200-millisecond pulse through the grounding conductor at various current levels. A GFCI may not trip at minimum current levels (that is, 6-20mA) in such a short period of time. (For example, UL Standard 943 allows trip times of up to 1.5 seconds at 15mA.) This tester provides a 4-second interval between pulses and cannot be adjusted to provide a longer pulse or a shorter interval.

Additionally, an employer cannot reasonably be expected to know at what level his or her GFCIs trip. A reasonable person would only expect the employer to check them periodically using their built-in test mechanisms.

3. Periodically (quarterly), the GFCI will be tested using the test button on a GFCI in combination with an attached load plugged into the circuit to be tested rather than a GFCI tester. A plug-in ground continuity tester would suffice as an attached load. If the lights on the continuity tester go out when the test button is pressed, the GFCI can be assumed to be operating correctly. If the lights stay on or if the test mechanism fails to operate, the GFCI is faulty, and needs to be replaced.
 4. The GFCI will not protect the employee from line-to-line contact hazards, (such as a person holding two "hot" wires or a "hot" and a neutral wire in each hand).
- d. Why GFCIs are required to be used on temporary wiring:
- Fixed wiring is secured and protected (conduit), therefore, fixed wire is not as exposed to the wear and tear of temporary wiring.
- e. Employees must use a GFCI on every job where they are using temporary wiring. If they are not going to use a GFCI, they will have to test and tag the cord or tool in accordance with the Assured Equipment Grounding Conductor Program.

NOTE: Employees must sign off on the Ground-Fault Training Log, (see Appendix 1.0), which the Ground-Fault Program Coordinator will collect and maintain.

((SECOND GROUND FAULT PROGRAM BEGINS HERE))

B. The Assured Equipment Grounding Conductor Program

The Assured Equipment Grounding Conductor Program will require employees to physically test all cord sets and receptacles that are not part of the permanent wiring. A written copy of this program will be maintained at the jobsite. Every cord set and receptacle will be tested on a quarterly basis. This testing will be identified by tagging the male end of the plug with a colored piece of tape (a different color tape will be used for each calendar quarter). Every employee affected by this program will have a tester.

1. Equipment

All employees are to have a tester. The receptacle tester to be used will check correct wiring for 15 or 20 amp, 120V AC single-phase 3-wire receptacles, with color lamp combinations that indicate correct wiring.

2. Testing

- a. All cord sets and receptacles must be visually inspected prior to use. This will help employees identify any visual problems with their equipment.
- b. All equipment grounding conductors will be tested on a quarterly basis. This will identify any internal problems that cannot be visually identified. Testing will also be required for the following:
 - 1. When equipment is initially brought onto the jobsite (before the first use).
 - 2. When a daily visual inspection identifies a problem.
 - 3. When equipment is brought back into service after being repaired.
- c. All testing required in Section B.2.b. must be documented using Appendix 2.0. This documentation must be kept at the facility or jobsite for the current year. (If an OSHA compliance officer inspects the jobsite they will want to see this documentation.)

3. Identification of Testing

To show that the required testing is being conducted, the tagging system Johnson Controls uses is to tape the end of the male plug with a colored piece of tape. Any type of electrical tape can be used in these four colors:

| | |
|-----------------------------|-------------|
| Quarter #1 January-March | Yellow Tape |
| Quarter #2 April-June | Red Tape |
| Quarter #3 July-September | White Tape |
| Quarter #4 October-December | Blue Tape |

4. Training

The Assured Equipment Grounding Conductor Program training will be performed in the work area, and include the following:

- a. Why the Assured Equipment Grounding Conductor Program is needed:

On construction or maintenance sites extension cords tend to get twisted, punctured, etc. This may result in a conductor becoming exposed which will allow for the potential hazards of electrical shock, burns, or fire. Daily visual inspections will identify any potential hazards and give employees an opportunity to correct them. Quarterly testing will identify any internal problems with the cord sets or receptacles.

- b. Conducting the Testing

The supervisor will show employees how to test cord sets and receptacles. Employees must be shown how to use the receptacle tester and the lights that indicate the wiring is good, and the lights that indicate incorrect wiring.

- c. Testing Requirements

Employees must be instructed when to test their cord sets and receptacles, and the following must be explained:

1. Cord sets and receptacles must be tested when temporary wiring is used.
2. Testing should be conducted on a quarterly basis, when equipment is initially brought on the jobsite, when the daily visual inspection identifies a problem, and when the equipment is returned following a repair.

3. In order to identify that a cord set or receptacle has been tested, a colored piece of tape must be placed on the male end of the plug.

NOTE: Employees must sign off on the Ground-Fault Training Log (see Appendix 2.0), which the ground-fault administrator should collect and maintain.

((THIS TRAINING LOG IS PROVIDED AS AN EXAMPLE. IF YOU WISH TO USE AN EXISTING INTERNAL TRAINING RECORD, PHOTO COPY ONE AND PLACE IT IN THIS APPENDIX. BE SURE TO INCLUDE A COPY OF THE TRAINING OUTLINE WITH THE TRAINING RECORDS.))

INSTRUCTOR: _____

INSTRUCTOR'S SIGNATURE: _____

[illegible]

ASSURED EQUIPMENT GROUNDING CONDUCTOR PROGRAM

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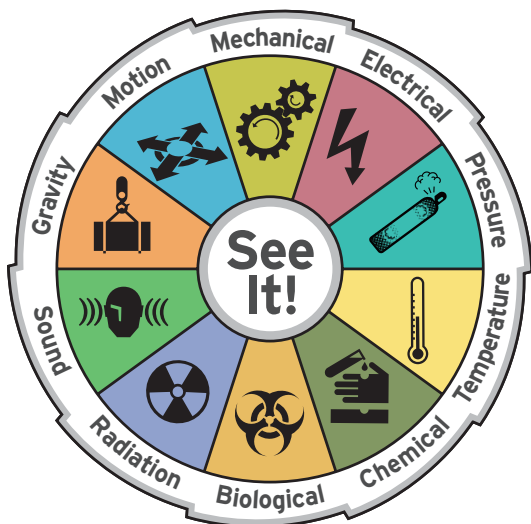
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APPENDIX 25

PREVENTING SERIOUS INJURY AND FATALITIES GUIDE

Preventing Serious Injury and Fatalities

Field Guide



Applying the Hazard
Identification Tool

Purpose

This field guide is a quick reference to help personnel involved in *high-risk activities*¹ to identify and control the significant potential hazards unique to each activity and job.

This field guide supplements but **does not replace existing permitting procedures and safe work practices**. To keep it brief, not every potential hazard or prevention is listed. Apply appropriate local hazard assessment procedures, along with this guide, to comprehensively assess each job.

Field Guide Applications

- Before beginning your high-risk activity, review significant potential hazards and associated preventions.
- Refer to the field guide in all phases of hazard assessment: during planning, permitting, implementing and closeout.
- Integrate this tool into local efforts on fatality and serious injury prevention.
- Build awareness among workers, supervisors and work leaders at meetings, field visits, shift turnovers and any other opportunity.
- Augment Managing Safe Work (MSW) field engagement and Contractor Health, Environment and Safety Management (CHESM) activities.
- Use during near-miss and incident investigations.
- Use as an Operational Excellence (OE) audit or self-audit tool for high-risk observations.

Preventing serious injuries and fatalities requires operational discipline. This means *performing every task the right way every time*, from initial hazard assessment through each step of the job, including post-activity review.

¹Activities, tasks and exposures most frequently associated with serious injuries and fatalities in Chevron and industry.

Hazard Identification Tool Definitions



Gravity
The force caused by the attraction of all other masses to the mass of the earth.
Examples: falling object, collapsing roof and a body tripping or falling



Motion
The change in position of objects or substances.
Examples: vehicle, vessel or equipment movement; flowing water; wind and body positioning when lifting, straining or bending



Mechanical
The energy of the components of a mechanical system, i.e., rotation, vibration or motion within an otherwise stationary piece of equipment or machinery.
Examples: rotating equipment, compressed springs, drive belts, conveyors and motors



Electrical
The presence and flow of an electric charge.
Examples: power lines, transformers, static charges, lightning, energized equipment, wiring and batteries



Pressure
Energy applied by a liquid or gas that has been compressed or is under a vacuum.
Examples: pressure piping, compressed cylinders, control lines, vessels, tanks, hoses and pneumatic and hydraulic equipment



Temperature
The measurement of differences in the thermal energy of objects or the environment which the human body senses as either heat or cold.
Examples: open flame; ignition sources; hot or cold surfaces, liquids or gases; steam; friction; and general environmental and weather conditions



Chemical
The energy present in chemicals that inherently or through reaction has the potential to create a physical or health hazard to people.
Examples: flammable vapors, reactive hazards, carcinogens or other toxic compounds, corrosives, pyrophorics, combustibles, oxygen-deficient atmospheres, welding fumes and dusts



Biological
Living organisms that can present a hazard.
Examples: animals, bacteria, viruses, insects, blood-borne pathogens, improperly handled food and contaminated water



Radiation
The energy emitted from radioactive elements or sources and naturally occurring radioactive materials (NORM).
Examples: lighting issues, welding arcs, solar rays, microwaves, lasers, X-rays and NORM scale



Sound
Sound is produced when a force causes an object or substance to vibrate and the energy is transferred through the substance in waves.
Examples: equipment noise, impact noise, vibration, high-pressure release and the impact of noise to communication

Abbreviations and Chemical Names

| | |
|------------------|--|
| CHESM | Contractor Health, Environment and Safety Management |
| CO | carbon monoxide |
| CO ₂ | carbon dioxide |
| CPR | cardiopulmonary resuscitation |
| GFCI | ground fault circuit interrupter |
| H ₂ S | hydrogen sulfide |
| JHA | Job Hazard Analysis |
| JLA | Job Loss Analysis |
| JSA | Job Safety Analysis |
| LPSA | Loss Prevention Self Assessment |
| MOC | Management of Change |
| MSW | Managing Safe Work |
| N ₂ | nitrogen gas |
| OE | Operational Excellence |
| OEMS | OE Management System |
| PFD | personal flotation device |
| PPE | personal protective equipment |
| PSP | Personal Safety Plan |
| PSV | pressure safety valve |
| RCD | residual current device |
| SWP | Safe Work Practices |
| TIF | Think Incident Free |

Hazard Analysis, a Requirement for All High-Risk Tasks

We eliminate or mitigate risks by identifying hazards, taking actions to reduce them and sharing what we know. Hazard analyses must be conducted by qualified people for the type of work and its potential hazards. Analysis may include:

1. **Planning Phase Analysis** such as Job Hazard Analysis (JHA), Safety Plan, Safety Instructions, Operating Procedures (with a review equivalent to a Planning Hazard Analysis), refinery instructions, review of safety plans, operator checklists or equivalent.
2. **Job Safety Analysis** (JSA), Job Loss Analysis (JLA) and JHA or equivalent including onsite review.
3. **Personal hazard assessment** tools, including Think Incident Free (TIF), Personal Safety Plan and Loss Prevention Self Assessment (LPSA) or equivalent.

Identify the Hazards and Take Action

- The first safeguard is you. To reduce the odds for human error, you must address any factors that may interfere with your readiness to perform well and to react effectively to unexpected events or changes.
- Review and follow the procedure for the task.
- Question what you would do in an emergency and include that information in the JSA document.
- Discuss the JSA with your co-workers to ensure it addresses the hazards associated with the work, that you understand what you will be doing and that you know how to do it safely.
- If the job changes: Stop, evaluate and revise the JSA as needed. Don't make snap decisions.

Potential Significant Hazards

A *potential significant hazard* is any condition, action or object that has the potential for an unplanned release of, or unwanted contact with, an energy source that may result in a serious or fatal injury.

Energy Source Hierarchy of Controls

Follow a *hierarchy of controls* approach to reduce the risk of a serious or fatal injury. Where possible, it is always best to first eliminate the hazard and then apply lower-level controls as needed. Based on the energy source, the hierarchy of controls is:

1. Remove the energy source.
2. Prevent the release of energy.
3. Protect from the release.
4. Use Stop-Work Authority.

Stop-Work Authority

All employees and contractors have the authority and responsibility to stop work that does not comply with the Tenets of Operation² or that presents an imminent hazard - without the threat of reprisal. Perform these steps in sequence if you feel your own work or the work of others is not safe:

1. Decide to intervene (take ownership).
2. Stop the unsafe act.
3. Notify immediate supervisors.
4. Resolve the issue.
5. Resume work (or stay shut down until risk is mitigated).
6. Share what you learned.

Do it safely or not at all.
There is always time to do it right.

²Tenets of Operation printed on back cover.

Human Performance

Human error has been shown to be a factor in nearly every serious incident and fatality. Your focus on improving human performance is critical to achieving an incident-free operation.



Distractions Can Happen to Anyone

In fact, the more familiar we are with the task, the easier it is to lose focus. Loss of focus can lead to an error. Even with established worker qualifications and the best tools and experience to guide us, we must also be personally ready to perform each job at our highest capacity.

The risk for error and injury goes up at all experience levels when individual or organizational factors, task demands or the work environment interfere with our ability to focus on our tasks.

Assess the Situation and Take Action

If you can answer “yes” to any of the assessment questions on the facing page, it may affect incident-free job performance. Preventive actions you or your supervisor can take to reduce the risks to working safely include:

- Get help.
- Get clarification.
- Get focused.
- Defer the work.

Human Performance Assessment Questions



Individual Factors

1. Are you feeling stressed, distracted or worried due to work or personal issues?
2. Are you excessively fatigued or do you have many things distracting you from the task at hand?



Task Demands

1. Are the procedures and instructions for the task unclear?
2. Does the task require high concentration or multitasking?
3. Does the task require more time than allowed?
4. Are you capable of performing the task but feel that you require more guidance?



Organizational Factors

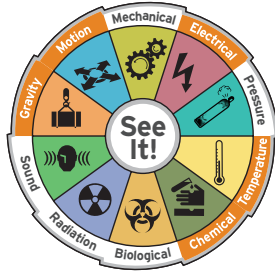
1. Do you feel insecure about your ability to use Stop-Work Authority?
2. Are you unclear about your roles and responsibilities?
3. Are you uncomfortable communicating with your peers and supervisors?
4. Do you feel pressured to take shortcuts?



Work Environment

1. Is the environment (temperature, ventilation, room for movement, egress, lighting or noise level) different from what was expected or planned for?
2. Are you in an environment prone to unanticipated distractions?
3. Are you working in unpredictable or constantly changing conditions?
4. Are labels, signs or displays inadequate?

Confined Space



Potential Significant Hazards



Emergency-related entry can be hazardous without proper planning, training and equipment.



Lack of oxygen due to N_2 , CO_2 or other agents can incapacitate staff in a confined space.



Flammable vapors may be present or build up during the work and create an explosive atmosphere.



Pyrophoric material (ignites on exposure to oxygen) may exist in vessels or pipes.



Toxic gases such as CO or H_2S can be hazardous in high concentrations.



Material in the space could shift and trap workers.



Converging walls or sloping floors can cause a fall onto unguarded equipment below.



Unguarded or exposed electrical equipment in a confined space poses a risk for electrocution.



Inadequate entry/exit methods (ladders, stairs and scaffolding) can cause falls and hinder evacuation.



Extreme temperatures in a non-ventilated space can lead to heat stress, heat stroke and other hazards.

Prevention Means Always:

- ☐ Ask: Is there a safer way to complete the job without entering the confined space?
- ☐ Comply with permitting requirements. Use of this field guide is not an equivalent.
- ☐ Provide supervisory job-site walk-through prior to permit approval and periodically during work.
- ☐ Establish a job-specific rescue plan, including rescue personnel and equipment, before entering the confined space.
- ☐ Keep a trained, CPR-certified entry watch at the assigned post throughout entry and any emergencies.
- ☐ Maintain an entry log at all times.
- ☐ Ensure workers entering confined spaces are fit for duty and qualified to work in a confined space.
- ☐ Complete and verify the isolation checklist - following approved isolation procedures - before starting work.
- ☐ Assess and eliminate pyrophoric materials prior to opening equipment (using temperature monitoring and air samples to confirm elimination as the material dries).
- ☐ Use adequate ventilation equipment, and follow all gas testing and monitoring requirements and procedures.
- ☐ Provide two-way communication (radios, *not* cell phones) for operations group and rescuers.



Electrical



Potential Significant Hazards



Lapses in focus while working on live electrical systems can present an electrocution hazard.



Electrically energized equipment and live electrical systems can expose workers to electrocution or arc-flash burns.



Overhead power lines can cause electrocution, especially near drilling rigs, ladders, lifting and other tall equipment.



Underground electrical cables can present hazards during any excavation, large or small.



Flammable vapor or material may ignite from sparks generated during electrical work.



Static electricity can ignite flammables during transfer operations.



Lightning is a potential hazard to anyone working outdoors, especially when working at height or in an open area.



Electrically powered equipment (power tools, extension cords, etc.) presents an electrocution hazard if it is improperly wired or if a short occurs.

Prevention Means Always:

- ☐ Minimize work on live electrical systems. The first choice is to de-energize.
- ☐ Comply with permitting requirements and standards for Electrical Safe Work Practices³ (SWP). Use of this field guide is not an equivalent.
- ☐ Provide supervisory job-site walk-through prior to permit approval and periodically during work.
- ☐ Require that only qualified electrical persons work on systems rated 50 volts and above.
- ☐ Require a qualified electrical standby person and use of applicable arc-flash and shock PPE by everyone involved in interactions with exposed energized parts.
- ☐ De-energize/isolate, lock and tag, test, and ground (if applicable) electrical equipment. Address all points of isolation documented in the isolation checklist.
- ☐ Assume equipment is live – *Test Before Touch* every time!
- ☐ Ensure required clearance when working near overhead power lines. (Consider a crane's full extension radius.) Use *Look up and Live* flagging, warning cones and a spotter for work near overhead power lines.
- ☐ Contact utility providers to locate underground lines.
- ☐ Inspect equipment and power cords before each use. Require ground fault circuit interrupter (GFCI) or residual current device (RCD) outlets for outdoor work with portable electrical tools and lighting.
- ☐ Adhere to grounding, bonding and transfer rates to prevent static accumulation and discharge during flammable material transfer operations.
- ☐ Suspend work and seek safe refuge during threat of lightning.

³See Chevron Corporate Required Standard for Electrical Safe Work Practice at <http://techstds.chevron.com/oe-corporate.asp>.



Excavation



Potential Significant Hazards



Lack of situational awareness while working in the trench can expose workers to significant hazards.



Underground electrical lines can present a hazard during excavations, large or small.



Underground pipelines may contain pressurized, flammable or toxic materials, creating a hazard if released during excavation.



Cave-ins can crush or suffocate workers if proper preventive measures aren't taken.



Lack of oxygen can incapacitate workers.



Flammable gases can be present or build up during the work and create an explosive atmosphere.



Some toxic gases, such as H_2S , are heavier than air and can collect in low spots, resulting in dangerously high concentrations.



Drowning is possible if there is a leak or if rain runoff fills the excavation.



Excavation equipment can become a hazard when it is moved or if it tips over during the excavation work.

Prevention Means Always:

- ☐ Ask: Is there a safer way to complete the job without working in the excavation or near heavy equipment?
- ☐ Comply with permitting requirements. Use of this field guide is not an equivalent.
- ☐ Provide supervisory job-site walk-through prior to permit approval and periodically during work.
- ☐ Provide a competent person to assess the soil, plan and permit, to inspect the excavation and to engage engineering professionals as needed.
- ☐ Use only qualified and authorized personnel to operate your excavation equipment.
- ☐ Contact utility providers to identify, locate and understand routing of underground utilities.
- ☐ Establish a job-specific rescue plan, including rescue personnel and equipment, before entering the excavation.
- ☐ Select and use appropriate shoring or benching methods as defined in the *Safety in Designs* manual.
- ☐ Provide appropriate means for entering and exiting excavations, such as ramps, ladders, etc.
- ☐ Store removed soil away from the edge (at least 2 ft/0.6 m) to avoid cave-ins or soil falling on workers.
- ☐ Secure and barricade the work site to prevent unauthorized access by vehicles and personnel.
- ☐ Prohibit standing or working under loads.
- ☐ Follow all gas testing and monitoring requirements and procedures, especially near running engines.
- ☐ Inspect the site at shift start and after any change or event (such as rain, new equipment or an earthquake).



Hot Work



Potential Significant Hazards



Inadequate surveillance of job site conditions (for example, not monitoring for combustible gas) may put personnel at risk.



Flammable gases can be present or build up during the work and create an explosive atmosphere.



Flammable and combustible materials in the work area can ignite from transfer of heat, sparks or slag.



Uncontrolled entry into a restricted work site by motor vehicles or other engine-driven equipment (such as generators and welding machines) can ignite a fire or cause an explosion.



Explosive pockets of gas can build up while performing underwater cutting or welding.



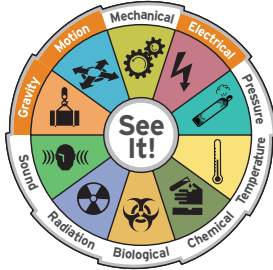
Compressed gas cylinders may explode if hoses catch fire or may become missiles if pressure is suddenly released.

Prevention Means Always:

- ☐ Ask: Is there a safer way to complete the job with cold work?
- ☐ Comply with permitting requirements. Use of this field guide is not an equivalent.
- ☐ Provide supervisory job-site walk-through prior to permit approval and periodically during work.
- ☐ Complete and verify the isolation checklist and follow approved isolation procedures before starting work.
- ☐ Make sure flammables can't be introduced during hot-work operations. Seal drain openings, tank vents and pressure safety valve (PSV) discharges.
- ☐ Clear hot-work area of combustibles and flammables.
- ☐ Cut vents in underwater equipment where necessary to allow flammable gases to escape.
- ☐ Adhere to all gas testing requirements. Test properly to be sure there are no pockets of flammable vapors.
- ☐ Have a dedicated fire watch onsite during the work and for at least 30 minutes after hot work.
- ☐ Inspect all equipment, and follow safe handling procedures for compressed gas cylinders and hoses.
- ☐ Secure and barricade the work site to prevent unauthorized access of vehicles and personnel.
- ☐ Enforce permits for motorized vehicles operating in classified hazardous areas.



Lifting and Rigging



Potential Significant Hazards



Unclear communication between crane operator and other personnel - including standing out of operator's line of sight - may increase the risk for incidents.



Complex lifts (dynamic, blind or on unstable seas) increase the potential for all lift hazards.



Unchocked pipes may become falling objects.



Improper rigging, misidentifying the load or equipment failure may cause dropped loads.



Loads striking personnel, vehicles or equipment can result in serious loss.



Equipment overloading, overextension and overturning can result from crane malfunction, outrigger setup, heavy winds or the load exceeding capacity due to extended use or miscalculations.



Shifting loads may cause overloading or falling objects.



High-voltage power lines in a crane's working area can pose a potential electrocution hazard.



Congested work area can limit rigger escape.

Prevention Means Always:











- ☐ Ask: Is there a safer way to complete the job without lifting and rigging?
- ☐ Comply with permitting requirements. Use of this field guide is not an equivalent.
- ☐ Provide supervisory job-site walk-through prior to permit approval and periodically during work.
- ☐ Use qualified or certified crane operators, riggers and signalmen with the required experience for the lift.
- ☐ Evaluate any potential to strike process equipment or to drop a load on it.
- ☐ Avoid blind lifts. If required, take extra precautions.
- ☐ Eliminate uncertified homemade lifting devices.
- ☐ Use approved binding and chocking equipment for loads and pipe racks.
- ☐ Keep signalmen in view of the crane operator, and make sure they *Look up and Live* to spot electrical lines and safely guide their operators.
- ☐ Use tag lines (non-conductive) to guide loads.
- ☐ Maintain required clearance when working near overhead power lines. Provide a separate spotter and warning cones to mark power lines. *Allow for a crane's full extension radius in the clearance.*
- ☐ Barricade and secure clear pick-up, lay-down and crane operating areas at all deck levels, and establish clear escape routes for riggers.
- ☐ Make sure to have enough space, proper ground conditions and proper outrigger deployment for mobile crane operations.
- ☐ Prohibit climbing on or walking under loads.
- ☐ Cease operations during offshore helicopter takeoff and landing.



Marine Work



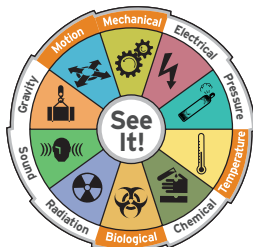
Potential Significant Hazards

-  **Entering offshore installation safety zones** without notice or permission creates a hazard.
-  **Improper use or failure to use personal flotation devices (PFDs)** dramatically increases the risk of drowning in the event of going overboard.
-  **Unapproved or poorly maintained equipment** (such as for lifting and rigging, life safety or personnel transfer) increases the risk of accidents.
-  **Diving activities** have their own inherent hazards.
-  **Personnel transfer** using crane lifting, swing ropes, transfer bridges and other means can be hazardous.
-  **Environmental conditions** such as fog, darkness, wind and storms increase risk during routine lifts, personnel transfer and boat or helicopter operations.
-  **Static accumulation** can ignite flammables during transfer operations.
-  **Anchoring near pipelines** increases the risk to equipment and staff.
-  **Taut deck lines, ropes and chains** carry potential energy that can release with strong force if broken.
-  **Wildlife** such as jelly fish, sharks, sea snakes and crocodiles can endanger staff working in the water.

Prevention Means Always:

- ☐ *Comply with permitting requirements. Use of this field guide is not an equivalent.*
- ☐ Provide supervisory job-site walk-through prior to permit approval and periodically during work.
- ☐ Prepare detailed dive plans that include rescue, Permit to Work and Simultaneous Operations plans as appropriate.
- ☐ Complete and verify the isolation checklist and follow approved procedures before starting work, for example, ensure water pumps are locked out/ tagged out before divers enter the water.
- ☐ Use only certified and inspected lifting, rigging, diving and personnel transfer equipment.
- ☐ Establish clear communications and gain permission before entering any 500 meter Safety Zone.
- ☐ Anchor in areas away from pipelines or obstructions.
- ☐ Stay aware of taut lines, and stay out of the line of fire for deck lines, ropes and chains.
- ☐ Avoid contact with marine wildlife by minimizing work in the water, conducting work when wildlife is less active, using barriers (cages, dive bell, shark guards), and using spotters, alarms and procedures, or PPE (protective suits, mesh gloves).
- ☐ Adhere to grounding, bonding and transfer rates and related procedures to prevent static accumulation and discharge during flammable materials transfer.
- ☐ Wear PFDs at all times when they are required.
- ☐ Adhere to seating assignments on crew boats.
- ☐ Adhere to a transfer plan for on- and off-boarding.
- ☐ Use Stop-Work Authority if you feel environmental conditions make the risk of continuing work too high.

Motor Vehicle and Motorized Equipment



Potential Significant Hazards



Distracted driving due to reaching for something, eating, or phone/radio/computer use is hazardous.



Recklessness (speeding, unplanned routes, seatbelts off, ignoring conditions) increases risk of crashes.



Impaired driving (fatigue, medications, substance abuse) slows reaction time and hinders judgment.



Poor visibility from weather or poor lighting, mirrors or obstructed view (dirty windows, load or vehicle structure) increase driver risk.



Road conditions (slick, potholes, loose gravel, soft shoulders) may cause loss of control or rollovers.



Oncoming traffic and speeds over 25 mph (40 kph) raise impact severity in collisions.



Unsecured cargo can strike occupants and cause loss of driver control.



Large loads in congested work sites may strike equipment and personnel.



Uncontrolled vehicle entry may cause ignition in classified areas and higher risk of struck-by injuries.



Pedestrian traffic and large-animal crossings can be unpredictable and present extra hazards.



Equipment failure (brakes, tires, lights) can lead to crashes.

21 Assess **all** of your job's specific hazards

Prevention Means Always:

- ☐ Question the need for all trips and for moving equipment in congested construction or work sites.
- ☐ Comply with permitting requirements. Use of this field guide is not an equivalent.
- ☐ Prepare and follow a journey management plan. Address congested work zones, heavy traffic, night driving and weather and road conditions.
- ☐ Perform a walk-around inspection of your vehicle before use. Perform recommended maintenance.
- ☐ Secure all inside cargo and any cargo to be hauled.
- ☐ Wear your seatbelt, and make sure passenger seatbelts are fastened before the car is started.
- ☐ Make driving your sole task while operating a vehicle: *Don't use a cell phone*, and avoid other distractions.
- ☐ Drive drug- and alcohol-free.
- ☐ Pull off the road in a safe place at signs of fatigue. Rest before proceeding, or have someone else drive.
- ☐ Use Smith System (or similar) defensive driving principles.
- ☐ Maintain the recommended speed and following distance. Adjust for traffic, road and weather.
- ☐ Pay attention to road conditions, pedestrians, animals and other vehicles.
- ☐ Use caution lights, traffic cones, barricades or flaggers to control vehicular traffic in work areas.
- ☐ Use flaggers or trained spotters, and maintain two-way communication with equipment operators, especially when backing heavy motorized equipment.
- ☐ Make eye contact with equipment operators when you are on foot to be sure the operator sees you.



Did you assess for human performance? 22

Work at Heights



Potential Significant Hazards



Inadequate equipment, improper use or non-use of fall protection, barricades, ladders and scaffolding increases the risk of serious harm.



Falling to a lower level without protection can lead to death or serious injury.



Falling objects (tools, equipment, etc.) can create serious hazards.



Environmental conditions (wind, rain, etc.) can present hazards when working at height.



Live electrical lines can pose an electrocution hazard to staff working at heights or positioning ladders.



Inadequately supported surfaces such as building or tank roofs, interior ceilings, decking and grating can lead to a fall.



Lightning is a potential hazard when working at height in an open area.



Suspension trauma is a hazard for any worker suspended too long in a fall-protection harness.

Prevention Means Always:

- ☐ Ask: Is there a safer way to complete the job without working at heights?
- ☐ Comply with permitting requirements. Use of this field guide is not an equivalent.
- ☐ Provide supervisory job-site walk-through prior to permit approval and periodically during work.
- ☐ Use trained qualified personnel for working at heights.
- ☐ Inspect fall prevention (harnesses, ropes, anchor points, arrest systems) for wear and tear before use.
- ☐ Equip scaffolding and elevated platforms with appropriate guardrails, toe-boards and netting, and have a qualified person inspect daily.
- ☐ Barricade, cover or guard surface openings. Caution tape is not a substitute for barricades. Maintain an exclusion zone beneath the work area.
- ☐ Set ladders on a firm base, correctly angled and tied off. Avoid overhead lines – *Look up and Live* when moving ladders and scaffolding.
- ☐ Avoid storing tools in high places when not in use. If using elevated storage, tie off tools to prevent falling.
- ☐ Use mechanical assist devices like ropes and pulleys to securely transport tools from grade to work level.
- ☐ Use full-body harness protection with 100% tie-off. Never rely on just a fall-protection belt.
- ☐ Use anchor points that are strong enough and high enough so that a fall will clear any obstructions.
- ☐ Have a plan to quickly rescue fallen or suspended staff.
- ☐ Be aware of electrical lines and weather conditions; use Stop-Work Authority if necessary.



Process Safety



We **always** assure safeguards are in place and functioning

We process, handle and transport hazardous materials every day. To do this safely, we must always maintain containment and control of these materials. Maintaining effective barriers, systems and safeguards is critical to preventing loss of process containment.

Significant Loss of Containment Events

- **Fires and vapor cloud explosions** can be fatal to workers in the immediate vicinity or surrounding area.
- **Toxic and hazardous releases** in sufficient quantities can be fatal to anyone who is exposed.
- **Release of hazardous energy or material** can cause significant equipment damage and endanger nearby workers.

Key Preventive Activities

- Maintain operation within safe limits.
- Follow operating procedures.
- Follow Management of Change procedures.
- Follow isolation procedures.
- Perform inspections and preventive maintenance.
- Follow maintenance procedures.
- Maintain process safety information.

25 Assess **all** of your job's specific hazards

Safeguards⁴

- ☐ Operate in accordance with procedures, and maintain the primary layers of protection.
- ☐ Identify critical process parameters, and stay within defined safe operating limits.
- ☐ Maintain the integrity of protective systems such as detectors, alarms, shut-ins, interlocks, over-speed trips, relief devices and fire protection systems.
- ☐ Assure proper isolation when opening process equipment or piping.
- ☐ Follow documented maintenance procedures.
- ☐ Provide onsite supervisory control, including pre-job walk-through and during work activities.
- ☐ Communicate effectively when issuing or receiving permits so that everybody understands the process hazards and how to safely transfer equipment custody between work crews and operations.
- ☐ Address condition changes that may affect process operations and equipment.
- ☐ Recognize process changes and follow Management of Change (MOC) procedures when appropriate.
- ☐ Conduct pre-startup safety reviews before introducing hazardous material or energy to verify equipment is safe to start up.
- ☐ Identify abnormal conditions and report them to supervision.
- ☐ Make certain that emergency procedures are well-understood and rescue drills conducted regularly.
- ☐ Report all loss of containment events; investigate to determine root causes and prevent recurrence.

⁴The "Swiss Cheese Model" describes how accidents may be caused. It proposes that incidents are the result of a series of failures or flaws in existing safeguards (procedures, training, inspection, alarms, etc.). The slices of Swiss cheese represent the safeguards, and the holes are the failures or flaws in each safeguard. Having multiple safeguards in place is analogous to a stack of different slices of Swiss cheese. It's when the holes line up and allow successive failures to go unchecked that a serious incident occurs.

James Reason (1990-10-26). Human Error. Cambridge University Press. ISBN 0521314194

❖ Did you assess for human performance? 26

Notes

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Preventing Serious Injury and Fatalities

Field Guide

Tenets of Operation

Do it safely or not at all.

There is always time to do it right.

1. Always operate within design and environmental limits.
2. Always operate in a safe and controlled condition.
3. Always ensure safety devices are in place and functioning.
4. Always follow safe work practices and procedures.
5. Always meet or exceed customers' requirements.
6. Always maintain integrity of dedicated systems.
7. Always comply with all applicable rules and regulations.
8. Always address abnormal conditions.
9. Always follow written procedures for high-risk or unusual situations.
10. Always involve the right people in decisions that affect procedures and equipment.

<http://go.chevron.com/fatalityprevention>

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