Idaho Transportation Department

Employee Safety Manual

Safety procedures, guidelines and practices to be utilized for all ITD activities and locations.

Getting you home safe --- every day!

YOUR *Safety* • • • ▶ YOUR *Mobility* • • • ▶ YOUR *Economic Opportunity*

Compliance with this safety manual is mandatory for all ITD employees. The practices outlined in this manual are designed to keep ITD employees safe from injury while on the job. This content, procedures and best practices are gleaned from various industry standards. In the interest of keeping this manual short, some guidance and procedures are referenced to other outside sources including OSHA standards. This does not indicate that ITD follows OSHA in all instances, or that OSHA standards apply to the State of Idaho. Rather the references in this manual to some OSHA standards is merely an acknowledgment that in certain specific instances OSHA has identified and articulated the best guidance available as a best practice.

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Chapter 1 – Safety Policies

1.1 Safety Policies.
This manual implements Board Policy 4056 – Employee Safety and Risk Management Program which directs ITD to develop and maintain an Employee Safety and Risk Management program. Board Policy 4056 also directs Department personnel to comply with all state and federal safety regulations. This manual also implements Administrative Policies 5560 – Personal Protective Equipment and ITD Issued Clothing, 5505 - Operating State-owned Vehicles, 5523 - Alcohol and Drug-free Workplace, 5552 - Employee Shift Duration and Fatigue Management and 5525 - Medical Testing for Employment

1.1.1. The Idaho Transportation Department (ITD) considers incident prevention a major objective in all department operations. The adverse impact on the utilization of manpower and property and the economic issues resulting from incidents require that incident prevention be given primary importance in every phase of ITD's activities. An Employee Safety and Risk Management (ESRM) Program (hereinafter referred to as the "Safety Program") shall be implemented to protect employees and develop a safer work environment, as well as lower insurance costs. Incident prevention efforts shall be required at all organizational levels, in all phases of department activities, and is the personal responsibility of each department employee.

1.1.2. **Individual Goal: Zero Workplace Injuries**.

1.1.2.1. Why it Matters: You are very important to ITD. The Department values every employee and wants you to go home safely at the end of every shift. The Department cannot achieve its mission without a healthy, safe work force.

1.1.2.2. As an ITD employee you must be committed to make ITD safer by:

1.1.2.2.1. Following safety policies, regulations, and safe work practices.

1.1.2.2.2 Actively participating in safety meetings, stand-downs and safety training.

1.1.2.2.3. Consulting the existing job safety analysis before work starts for jobs you are assigned, or developing a job safety analysis if one doesn't already exist.

1.1.2.2.4. Conducting yourself in a manner which does not place yourself or others in unsafe situations.

1.1.2.2.5. Taking immediate action to eliminate work-area hazards and/or remove yourself from the hazard, including stopping work when you deem the work to be unreasonably dangerous.

1.1.2.2.6. Immediately warning co-workers, and if necessary, the public, of work hazards.

1.1.2.2.7. Immediately informing your Supervisor/ Project Lead/ Manager/ Managing Engineer of unsafe situations and discussing actions to eliminate or mitigate hazards.

1.1.2.2.8. Reporting any workplace injury or ITD vehicle crash to your Supervisor/ Project Lead/ Manager/ Managing Engineer immediately after providing aid to the injured.

1.1.2.2.9. Report minor incidents that result in ITD property damage to my Supervisor/ Project Lead/ Manager/ Managing Engineer by the next day.

1.1.2.2.10. Reporting close calls, so that the information can be used as a learning/prevention tool.

1.1.2.3. **ITD Leader Goals:** In addition to the above, as a leader, manager, and supervisor, you must:

1.1.2.3.1. Emphasize and highlight safe working practices whenever possible.

1.1.2.3.2. Conduct visits to work centers and job sites to increase awareness of conditions and build trust for sharing concerns.

1.1.2.3.3. Review your employees' job-safety analyses to ensure risks are adequately addressed. This includes asking the following questions:

1.1.2.3.3.1. What are the hazards of this worksite/job before entering?

1.1.2.3.3.2. What actions are being done to mitigate those hazards?

1.1.2.3.3.3. What is each person's role in case someone gets hurt on THIS job?

1.1.2.3.3.4. Do they have everything they need (info, equip, staff) to do the job safely?

1.1.2.3.3.5. Are we doing everything we can to make this job as safe as possible?

1.1.2.3.3.6. Is ITD safer today than yesterday?

1.1.2.3.4. Take note of employee safety concerns and act upon what you hear.

1.1.2.3.5. Start routine meetings with meaningful safety and/or security shares.

1.1.2.3.6. Review policies with an eye toward employee safety and develop safe work practices.

1.1.2.3.7. Manage overtime and comp-time accrual through use of the rolling comp-time accrual cap and the Fatigue-Management Policy and reinforce that comp time is primarily to be used to recover from extended work shifts.

1.1.2.3.8. Support Personal Protection Equipment (PPE) programs, ensure PPE is provided, and hold staff accountable for proper PPE care and use, for their protection.

1.1.2.3.9. Emphasize staying safe in the roadway through use of the Short Duration Operations and Very Short Duration Operations temporary traffic control matrix.

1.1.2.3.10. Participate in safety activities (e.g., weekly or monthly safety talks, safety stand downs).

1.1.2.3.11. Utilize information from good catch reports as a learning/prevention tool by sharing near miss information.

1.1.2.3.12. Report good catches and recognize employees for doing the right thing.

1.1.2.3.13. Debrief after every safety-related incident with a focus on improved safety/prevention; share lessons learned.

1.1.2.3.14. Document safety meetings on the ITD Form 1965 and shop inspections on ITD Form 1966.

1.1.2.4. Commitment, motivation, and self-discipline are key factors necessary to reach our goal. The goal can be accomplished with total commitment by the entire department. Management's goal is to make the ITD work environments as safe as practical. All Supervisor/ Project Lead/ Manager/ Managing Engineers and employees shall be instructed in safety as it pertains to their work assignments, their work environments, and the equipment and materials in their vicinity or use. The front-line supervisor/project lead and employee have the first opportunity to recognize and eliminate unsafe conditions and work methods before an incident or injury occurs.

1.1.2.5. Each division, district, and section shall adhere to this ITD Safety and Risk Management Manual and implement a safety program specific to their work in compliance with guidelines and policies.

1.1.2.6. Employees and Supervisor/ Project Lead/ Manager/ Managing Engineers shall be held accountable for vehicle or property damage and shall be rated on safety efforts in their performance review. When other methods fail to motivate employees to follow, implement, or enforce safe work practices, disciplinary action up to and including dismissal shall be considered.

1.1.3. ITD Safety Program Goals.

1.1.3.1. To reduce or eliminate the number and severity of incidents through aggressive promotion of safe work practices.

1.1.3.2. Provide employees with regulatory information and basic safety procedures in all work operations.

1.1.3.3. Assist Supervisor/ Project Lead/ Manager/ Managing Engineers in setting minimum level safety goals.

1.1.3.4. Assist Supervisor/ Project Lead/ Manager/ Managing Engineers to identify and reduce or eliminate workplace hazards.

1.2 Safety Program Administration.

The ESRM Manager reports to the Chief Innovation Experience Officer and administers the ITD Safety Program with the assistance of the District Safety Compliance Officers (SCO) to:

1.2.1. Develop and implement the Safety Program components and provide consultative services for these areas to department management.

1.2.2. Reviews work environments, equipment, job procedures, and construction projects for hazards and regulatory code compliance.

1.2.3. Provide direction to the District Safety Compliance Officers on safety matters.

1.2.4. Department liaison to the Idaho State Insurance Fund and Industrial Commission for worker's compensation insurance coverage.

1.2.5. Review all department tort claims, facilitates investigations and responses, and assist in follow-up actions.

1.2.6. Report on property damage or loss due to catastrophic events for insurance and inventory purposes.

1.2.7. Review all vehicular and work-related injury incidents and assist in identifying the root cause and relevant prevention strategies.

1.2.8. Develop and implement industrial hygiene programs (indoor air quality, hearing conservation, respirator use, etc.).

1.2.9. Provide and review biological monitoring materials for positions that require employees to be exposed to paints, chemicals, welding or toxic materials.

1.2.10. Distribute proper equipment usage information, job safety analyses, workplace hazardous material communication information and other safety education materials.

1.2.11. Performs driver record checks and authorizes motorized equipment operation.

1.2.12. Acts as the Designated Employer Representative for the Drug and Alcohol Free Workplace program and Federal Motor Carrier Safety Administration drug testing program.

1.2.13. Coordinate evacuation of the building in conjunction with the Emergency Manager and facilities maintenance staff during emergencies.

1.2.14. Facilitate training and informational meetings on safety and health matters.

1.2.15. Work with external agencies on risk management, workers compensation, industrial hygiene, and other issues.

1.2.16. Provide information and reports to management on all facets of the Safety Program as required.

1.2.17. Employee Safety and Risk Management Section: The staff of the ESRM section reports directly to the Manager and performs the following**:**

1.2.17.1. Presents headquarters' New Employee Safety Orientations and schedules safety and health presentations.

1.2.17.2. Coordinates communication between the ITD Districts, Divisions, Department of Administration Risk Management, the State Insurance Fund and the Division of Building Safety.

1.2.17.3. Maintains a computerized data base of employee injury incident and vehicle damage to be used in department prevention efforts.

1.2.17.4. Provides support for the District Safety Compliance Officers and coordinates appropriate activities with the Wellness Program.

1.2.17.5. Maintains resource information on available safety video libraries and information on preventative safety and health concerns.

1.2.17.6. Responsible for the record keeping and reporting of employees that are eligible for safety awards.

1.2.18. District Safety Compliance Officers: The District Safety Compliance Officers are under the direct authority of the respective District Engineers, with program direction from the ESRM. The SCO performs the following for the District Safety Program:

1.2.18.1. Reviews all District tort claims, facilitates investigations and responses, and assists in follow-up actions.

1.2.18.2. Reviews all District vehicular and work-related injury incidents, assists in investigations, identifies root causes and assists Supervisor/ Project Lead/ Manager/ Managing Engineers in development of preventative strategies, and inspects work sites and equipment.

1.2.18.3. Provides and reviews biological monitoring materials for positions that require employees to be exposed to paints, chemicals, welding fumes or toxic materials. Arranges medical appointments to accomplish blood tests and respiratory pulmonary function exams.

1.2.18.4. Coordinates evacuation of the building in conjunction with other facilities staff during emergencies.

1.2.18.5. Implements industrial hygiene programs (indoor air quality, hearing conservation, respirator use, etc.) and consults with Supervisor/ Project Lead/ Manager/ Managing Engineers on appropriate protective equipment.

1.2.18.6. Coordinates with the District Trainers to schedule, facilitate and as needed teach employee safety training sessions in the District.

1.2.18.7. District Safety Compliance Officer and the ESRM monitor all areas of the Safety Program and notify the appropriate Supervisor/ Project Lead/ Manager/ Managing Engineer in writing of any code or safety policy violations with recommendations for corrective actions. The Supervisor/ Project Lead/ Manager/ Managing Engineer responds as to the corrective action taken.

1.2.19. Minimizing Workplace Hazards.

1.2.19.1. Supervisor/ Project Lead/ Manager/ Managing Engineers and safety officers at all levels shall assess the workplace for mechanical, physical, chemical, atmospheric and noise hazards. Supervisor/ Project Lead/ Manager/ Managing Engineers shall utilize the below hierarchy of controls to determine the implement reasonable controls to reduce hazards to acceptable levels.

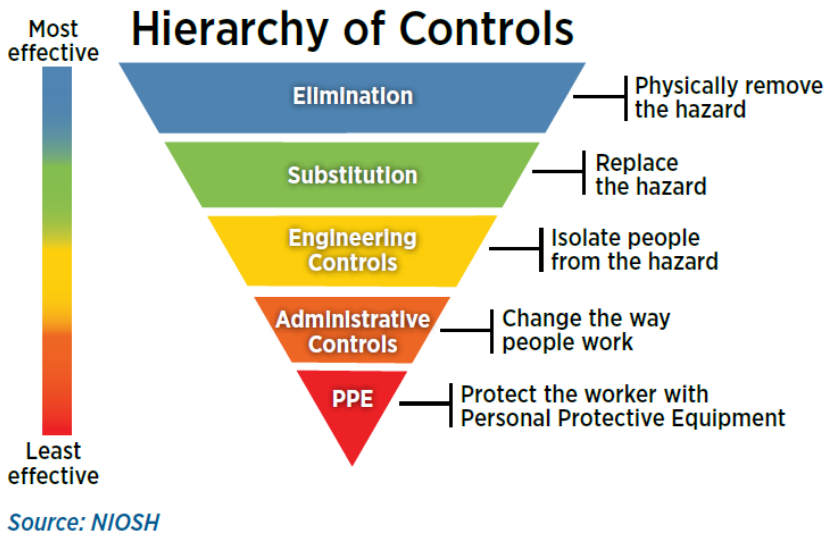
1.2.19.1.1. Elimination Controls: Eliminate or stop the activity or transfer the operation to another entity

1.2.19.1.2. Substitution Controls: Substitute with a less hazardous operation or material

1.2.19.1.3. Engineering Controls: Engineering physical barriers to isolate workers from the hazard.

1.2.19.1.4. Administrative Controls: Job rotation schedules and mandatory work-rest cycles can be used to reduce mishap potential. This does not eliminate the hazard and is not as reliable as engineering controls.

1.2.19.1.5. Personal Protective Equipment (PPE). PPE is the least effective method of protecting workers from hazards and should be used only as a last option.



1.3. Job Safety Analysis (JSA).

1.3.1. Job Safety Analyses (JSA) will be conducted to identify existing or potential job-related hazards and to determine the best way to perform the job in an effort to reduce or eliminate those hazards. The JSA will be used to establish proper step-by-step job procedures and train employees in safer and more efficient work methods. Improved job procedures protect workers from accidents, reduce costs related to equipment damage and worker's compensation, and can often lead to increased productivity. JSAs will be used in new employee orientation to their work duties, and at safety meetings as a refresher for current employees. JSAs will not be used as a substitute for following the Hierarchy of Controls as identified in paragraph 1.2.19. above. Only after engineering and administrative controls have been applied to the maximum extent practicable, or until controls can be installed, will PPE be the primary means to protect personnel against hazards.

1.3.2. Instructions for Completing JSA (ITD Form 2842).

1.3.2.1. Front Page is self-explanatory. Title the JSA with the relevant job, process or equipment it pertains to.

1.3.2.2. Column 1: Break the task down into its basic steps. For example, what is done first, what is done next? You can do this by: (1) observing the task, (2) discussing it with workers, (3) using your experience and knowledge of the task, or (4) a combination of all three. Record the steps of the task in their normal order of occurrence. Describe what is done; not the details or how it is done. Three or four words are normally enough to describe each task step.

1.3.2.3. Column 2: Identify and document the hazards associated with each step. For each step, ask yourself what could happen to workers performing the task and what the probability would be of the mishap occurring. Get the answers by: (1) observing the task, (2) discussing the task with workers and/or (3) using "lessons learned" from other mishaps. Ask the questions:

1.3.2.3.1. Can workers be struck by or contacted by anything that can cause an injury?

1.3.2.3.2. Can they strike against or be exposed to any item that can cause injury?

1.3.2.3.3. Can they be caught in or between anything?

1.3.2.3.4. Can they fall?

1.3.2.3.5. Can they overexert themselves?

1.3.2.3.6. Are they required to do repetitive lifting or heavy lifting?

1.3.2.3.7. Are there potential hazards such as hazardous atmospheres, chemical substances, physical agents (including noise, ergonomic and thermal stress), ionizing and non-ionizing radiation or biological exposures?

1.3.2.4. Column 3: Identify and document controls or hazard reduction methods. For each hazard identified, consider the following questions:

1.3.2.4.1. How can the procedure be modified to eliminate or reduce the hazard?

1.3.2.4.2. How should workers perform the task step to avoid an incident or eliminate the potential hazard?

1.3.2.4.3. What can be done to eliminate or remove or reduce the hazard by redesigning the work area or equipment?

1.3.2.4.3.1. Describe in detail the precautions workers must take and ensure that these steps are included in the task procedure or checklist. Take special care to ensure important steps or details are not omitted from the task and that guidance is clear, specific and easily understood by workers.

1.3.2.4.3.2. Identify the personal protective equipment required for each task in this column.

1.4. Employee Safety Recognition Program.

1.4.1 In support of the strategic goal to Make ITD Safer, ITD will encourage employee safety by recognizing and rewarding repeatable safe behaviors that set an example for others. This program will further promote a safety culture and recognize both long-term safe habits as well as recognize instances of safe behavior.

1.4.1.1 Five-Year Milestone Medallions.

1.4.1.1.1. Award Criteria.

1.4.1.1.1.1. Cannot have had a Safety incident resulting in written warning or greater

1.4.1.1.1.2. Subsequent medallions will be awarded for every 5 cumulative years.

1.4.1.1.1.3. If the employee has had a Safety incident resulting in written warning or greater they will lose one year of safety milestone medallion eligibility. For example, they would receive their five-year award in their sixth year.

1.4.1.1.2. Distribution and Management.

1.4.1.1.2.1. The Employee Safety and Risk Management office will determine eligibility for milestone medallions and provide rosters to the appropriate Division/Districts.

1.4.1.1.2.2. The Employee Safety and Risk Management Office will order medallions through the Headquarters purchasing office.

1.4.1.1.2.3. The Employee Safety and Risk Management office will disperse the medallions to the Safety Compliance Officers for their District's personnel.

1.4.1.1.2.4. District Safety Officers will coordinate with the District Engineer to determine the appropriate time/location for awarding medallions.

1.4.1.1.2.5. The Employee Safety and Risk Manager will coordinate HQ Executive Staff to determine the appropriate time/location for awarding medallions for HQ personnel.

1.4.1.1.2.6. Safety milestone medallions awards should be presented in a group setting.

1.4.1.2. **Challenge Coins** (one time recognition).

1.4.1.2.1. Award Criteria.

1.4.1.2.1.1. Any employee may receive a coin for exhibiting safe behavior.

1.4.1.2.1.1. Any employee or group of employees may be recognized for performing a hazardous activity in a safe manner.

1.4.1.2.2. Distribution and Management.

1.4.1.2.2.1. Coins have various designs which represent Divisions of Administration, Highways, Aeronautics, and Motor Vehicles.

1.4.1.2.2.2. Bronze Coin (more numerous): to be awarded by Maintenance Supervisors, Unit Supervisors, Operations/Resident Engineers and Safety Officers for more frequent on-the-spot examples of safe behaviors.

1.4.1.2.2.3. Silver Coin: to be awarded by Division Administrators, District Engineers and the Employee Safety and Risk Manager for more significant safe behaviors.

1.4.1.2.2.4. Gold Coin (least numerous): to be awarded only by ITD Executives. Any Executive may award a gold coin for instances of exemplary safe behavior. This may result in presenting multiple coins if a group or team is to be recognized.

1.4.1.2.3. How employees will be recognized?

1.4.1.2.3.1. The challenge coins are meant to generate conversations among employees about safe practices.

1.4.1.2.3.2. Stories from recipients will also be shared with other employees via Transporter articles and Safety Shares at other meetings.

1.4.1.2.3.3. District Safety Officers can help gather details on these instances or events.

1.4.1.2.3.4. The Office of Communication staff will assist in promoting these achievements. Supervisors are encouraged to share the “why” with recipients and their groups.

1.4.1.2.3.5. The recipient's name and details of the awards should be forwarded to the district Safety Officers and Office of Communication staff for inclusion in Directors Communications and Transporter Articles.

Chapter 2 – Material Lifting and Carrying

2.1. Special Requirements.
Strains, sprains, hernias, fractures, bruises and lacerations may result from poor manual material handling and lifting practices. Lifting, carrying, dropping and lowering are the common physical acts responsible for these injuries. Many strains result from improper lifting techniques, lifting with no assistance or failure to use required and available manual material handling equipment.

2.2. Manual Handling.
Influencing factors when manually lifting materials include the size, shape and weight of the object to be lifted, and distance to be moved. Proper lifting techniques are as important as the weight of the object. Heavy materials or awkward positions may require mechanical assistance or team lifting be used. Refer to paragraph 2.6.3 for additional guidance on team lifting.

2.3. Lifting and Carrying.
Several variables influence a worker‘s ability to manually handle and lift materials. Physical capabilities of the individual and variables in the work environment need to be considered. Proper consideration and knowledge of worker limitations and the use of correct lifting and carrying techniques will reduce the possibility of injury.

2.3.1. Physical characteristics include factors such as strength, mobility, fatigue and motor functions of the individual.

2.3.2. Psychological considerations include the motivation, emotional state, job satisfaction and attitude of the individual toward work.

2.3.3. Pre-existing worker injuries should also be considered, if known. Workers shall inform their supervisor of any pre-existing conditions that limit the workers lifting ability.

2.3.4. Task variables include the weight, size, shape, distribution, degree of shift (of the load in the container) and the location of the center of gravity (CG) of the load to be handled.

2.3.5. Workplace layout and the degree of movement required, obstacles, distances moved and direction of movement shall be considered.

2.3.6. Level of demand to include frequency of lift, duration of lifting task, accelerations and velocities of lift, shift duration, degree of precision and relative proportion of muscles involved in the lift shall be considered.

2.3.7. Environmental variables such as heat and cold stress, noise and vibration, lighting, traction, stability of the work platform and atmospheric contaminants shall also be considered.

2.4. Training.
Supervisors shall ensure their workers receive thorough instruction and training on proper manual lifting techniques both routine or high risk lifting and any PPE required. In addition, workers shall be instructed in the use of available manual lifting devices. To the new worker, hand trucks and wheelbarrows look deceptively easy to use. Supervisors shall instruct workers

on their use. Improvements in work methods, eliminating manual material handling hazards and understanding the stresses involved during manual handling are important and need to be addressed during training. This training shall include both verbal and hands on demonstrations of how to do the task correctly with proper motions.

2.5. Minimizing Manual Material Handling Hazards.

2.5.1. **Engineering Controls:** The preferred method to minimize risks of manual lifting is the use of engineering controls/mechanical assists to decrease force, repetition, distance of travel and frequency of manual handling activities. Some examples include use of scissor tables, elevators, conveyors and gravity chutes.

2.5.2. **Administrative Controls:** Job rotation schedules and mandatory work-rest cycles can be used to reduce mishap potential, but do not eliminate the hazard and are not as reliable as engineering controls.

2.5.3. **Work Design Principles:** Conduct a JSA to identify potential hazards and, when practical, arrange tasks and select workstations using the following principles: (Note: A JSA is not required when existing guidance adequately covers all safety requirements of an operation or process.) Refer to Section 2.1.1 in this Safety Manual

2.5.3.1. Place objects to be lifted at the approximate height of the knuckles when the arms dangle at side of the body.

2.5.3.2. Place object as close to the body as possible.

2.5.3.3. Do not twist the back while picking up, putting down, carrying or changing direction with an object. When rotating, rotate with the hip joint. Crouch down while keeping the object close in to lower the object.

2.5.3.4. Limit stack height to shoulder level. If items must be stacked higher, provide step-up access to eliminate lifting above shoulder level.

2.5.3.5. Use grips, handles and other devices to provide better control of items.

2.5.3.6. Slide materials instead of lifting, whenever possible.

2.5.3.7. Use gravity assist in moving materials.

2.5.3.8. Ensure adequate maneuvering space to eliminate the need to twist the body.

2.5.3.9. Team lifting will be used when items are known to weigh more than 50 pounds or when items are lifted from an awkward position or location. Refer to paragraph 2.6.3 for additional guidance on team lifting.

2.6. Proper Lifting Methods.

No single technique exists to prevent injury during lifting and material handling. The best prevention strategy is to utilize effective ergonomic techniques, i.e., ensure workstations are properly designed, loads are manageable in both size and weight distribution, the frequency and

duration of lifting are not excessively stressful and workers can demonstrate a knowledge of proper techniques for material handling. There are three basic methods of lifting: straight back-bent knees, free style and kinetic. Each has advantages and limitations. Refer to Figure 2.1 for an illustration of proper lifting technique.

2.6.1. The kinetic method is the most widely accepted and taught because it provides more stability for the worker while reducing load on the back muscles and intervertebral disks.

2.6.1.1. Inspect the object before lifting to make certain no grease or slippery substance will cause the object to slip. Also inspect the object for slivers, sharp edges and rough or slippery surfaces before attempting to lift.

2.6.1.2. Position feet correctly. Place feet far enough apart for balance with one foot to the rear of the object and the other foot slightly ahead of the other foot and to the side of the object.

2.6.1.3. Crouch close to the load. Stay close to the load to minimize strain on the back muscles.

2.6.1.4. Always keep the back as straight as possible. It may not be possible to keep the back in the vertical plane but avoid arching the back. Bend from the hips and not from the middle of the back.

Figure 2.1. How to Lift Properly.

2.6.1.5. Pick up materials with a full palm grip. Do not attempt to pick up items using a fingertip grip. Gloves (leather or leather-palmed) shall be worn when lifting objects which have sharp or burred edges, or splintered surfaces.

2.6.1.6. With the arms, slide the object towards the body putting it in motion (kinetic energy). At the same time, lift the object with the legs and bring the back to a vertical position. Keep the object close to the body; avoid twisting while lifting.

2.6.2. **Setting the Object Down.** Use the same motion as when lifting, but reverse it to set an object down. Lower the load by bending the legs and crouching with the back straight. Take care when releasing the load to prevent injury to fingers, hands or feet.

2.6.3. **Team Lifting.** Always seek and obtain assistance, when it is necessary to move heavy or unusually shaped items manually. Assign additional workers to the task when it is not practical to use mechanical equipment. When two or more people are required to move or carry an object, adjust the load so each person carries an equal part. If possible, use workers similar in size and train them in team-lifting. Workers need to understand that if one worker lifts too soon, shifts the load, or lowers improperly, that person or their partner(s) may be overloaded and strained. Test lifts should be made before proceeding. The key to lifts using two or more people is to make every move in unison. Assign one person to give orders to ensure the necessary coordination for movement. The supervisor and workers are responsible for assessing all available methods to safely handle materials and for using mechanical assistance whenever possible.

2.7. Carrying Methods.

Acceptable carrying methods differ based upon the type of material, distance and number of workers. Workers should be instructed during initial training in each procedure. For example: neck, shoulder, side, tray, two-person, under-arm carry methods, etc.

2.7.1. Points to Remember:

2.7.1.1. Use appropriate PPE for each task, such as gloves and protective footwear, as required by **Chapter 6**.

2.7.1.2. Keep fingers away from pinch and shear points.

2.7.1.3. Make sure the path of travel is clear.

2.7.1.4. Do not carry a load that obstructs the view of the direction of travel.

2.7.1.5. Do not twist with the back to change direction or put an object down. When rotating, rotate with the hip joint. Crouch down while keeping the object close in to lower the object.

2.7.2. **Types of Carrying Methods:**

2.7.2.1. Neck Carry Method: In this method, the material is carried on the back of the neck and shoulders with both arms lifted to shoulder height and the hands grasping the sides or top of the load.

2.7.2.2. Shoulder Carry Method: The load rests on one shoulder with the near arm helping to support the weight and the other arm brought across the body to steady the load.

2.7.2.3. Side Hand Carry Method: This is simply the suitcase method and can be used only where the load may be grasped by a handle or equivalent.

2.7.2.4. Tray Carry Method. The material is carried in front of the abdomen with both hands placed under the bottom surface and the body serving as the balancer.

2.7.2.5. Two Person Carry Method. A load is carried by two people who use oral signals to coordinate their movements. They decide on appropriate emergency signals to be given if the grasp of either person should slip. They walk in step to coordinate their movements.

2.7.2.6. Under-arm Carry Method. The material is carried under one arm with the other arm brought across in front of the body to steady and balance the load. Also called Side Under-arm Carry Method.

2.8. Carrying Items Up or Down Stairways.

2.8.1. Adhere to the guidance provided by the supervisor.

2.8.2. Try to reduce the bulk or size of the object carried to allow for maximum visibility.

2.8.3. Use assistance when required and available.

2.8.4. Use mechanical material handling equipment whenever loads are too heavy or bulky to be lifted or carried efficiently or safely by hand.

2.8.5. Whenever possible store heavy materials on the ground floor of the facility to avoid the need to carry heavy items up or down stairs.

2.9. Manual Material Handling Equipment (MHE).

This equipment shall be used whenever loads are too heavy or bulky to be lifted or carried efficiently or safely by hand. Hand trucks, dollies, two-wheeled hand trucks and wheelbarrows (when properly used) simplify materials handling and greatly reduce the hazards of handling supplies and equipment.

2.9.1. **Hand Trucks, Dollies, and Wheelbarrows.** Hand trucks, dollies, wheelbarrows or other manual devices shall be used to lift and/or carry bulky or heavy items whenever possible. Apply the following basic principles when using this equipment:

2.9.1.1. Tip the load to be lifted forward slightly so the tongue of the handling equipment goes under the load.

2.9.1.2. Make sure the tongue of the hand truck is all the way under the load prior to movement.

2.9.1.3. Keep the center of gravity of the load as low as possible. Place heavy objects at the bottom of the load. Keep feet clear of the wheels.

2.9.1.4. The center of gravity of the load on both the hand truck and wheelbarrow shall be kept as low as possible. The weight should be forward so it will be carried by the axle, not the handles. If loaded correctly, the material handling equipment should carry the load—the operator need only balance and push.

2.9.1.5. Place the load so it will not slip, shift or fall. Load only to a height that allows a clear view ahead. For added safety, strap or chain bulky or dangerous cargo, such as cylinders or drums, to the handling equipment‘s frame.

2.9.1.6. Avoid walking backward with handling equipment if possible. This eliminates the need for workers to look over their shoulder to see clearly.

2.9.1.7. Never brake handling equipment by putting your foot on a wheel; keep your feet clear of the wheels at all times.

2.9.1.8. Move the handling equipment at a safe speed. Do not run. Keep the handling equipment constantly under control.

2.9.1.9. When handling equipment is loaded in a horizontal position, proper lifting procedures discussed in paragraph 2.6 shall be used to prevent operator injury.

2.9.1.10. Two-wheeled hand trucks and wheelbarrows are designed in a variety of shapes and sizes for both general and special purposes.

2.9.1.11. Secure and store unused trucks in a designated area where they don't create a hazard or traffic obstruction.

2.9.2. **Multi-Wheel Trucks.** As with two-wheeled equipment, multi-wheeled trucks, pallet jacks and dollies vary greatly in design and use. Most mishaps occur due to improper parking, causing the worker to trip and fall over the equipment, or improper loading of material, which causes the cart to tip. Extra emphasis shall be placed on worker training in these two areas, along with frequent observation of work practices to immediately correct unsafe acts. In addition:

2.9.2.1. When loading, arrange the cargo so items won‘t fall.

2.9.2.2. If the truck has no drawbar, push it. Keep hands behind the cart.

2.9.2.3. If the truck has a drawbar, pull it, to allow for a better line of sight. Stand to one side to keep the truck from running into ankles.

2.9.2.4. If there are floor markings, stay within their boundaries.

2.9.2.5. When storing the truck, lock or block its wheels.

2.9.2.6. Don‘t misuse the truck.

2.9.2.7. Don‘t ride on a truck designed for a walking operator.

2.9.2.8. Don‘t carry other people on the truck.

2.9.2.9. Don‘t exceed the truck‘s maximum load capacity.

2.9.2.10. Ensure the weight of the truck, plus its load, does not exceed posted floor loads.

2.9.2.11. Ensure adequate clearance in aisles and other tight areas.

2.9.2.12. Remember that the momentum of a truck can make it hard to change speed or direction.

2.9.2.13. Watch for pedestrians—always give them the right-of-way.

2.9.2.14. Don‘t block aisles, doorways or material another worker may need.

2.9.3. **Lever-Operated Hoists.** (ratchet operated chain or cable hoist (come-along))

2.9.3.1. Acquisition: Lever-operated hoists shall meet industry standard requirements and specifications.

2.9.3.1.1. Capacity of all lever-operated devices shall be permanently and conspicuously marked in an easily visible place on the hoist.

2.9.3.1.2. Only ratchet and pawl, and load brake hoists, with a means to prevent a suspended load from self-lowering, shall be procured. Lowering under load shall be by operation of the hoist lever.

2.9.3.2. Inspections: Daily or prior to each use, lever-operated hoists shall be inspected for:

2.9.3.2.1. Loose or worn parts, nuts, bolts, etc.

2.9.3.2.2. Cracked or broken welds or parts.

2.9.3.2.3. Deformed or damaged hooks or chain.

2.9.3.2.4. Bent or deformed pawls.

2.9.3.3. An annual inspection shall be conducted on all MHE. The inspection shall include:

2.9.3.3.1. Complete inspection of all wire rope, chain and fittings or attachments.

2.9.3.3.2. Inspection of brakes, pawls or other holding features.

2.9.3.3.3. Inspection of the chain length. Chains that have elongated more than one fourth of an inch in 12 inches or as required by manufacturer‘s instruction shall be removed from service.

2.9.3.4. Identification Tags: Identification tags shall be attached to all hoists and shall include the following information: date of inspection, date of proof test, capacity of hoist and identification number of hoist.

2.9.3.5. Maintenance and Testing:

2.9.3.5.1. All new hoists shall have the manufacturer‘s certification indicating that all proof-testing has been accomplished. All hoists which have had load-suspension parts altered, replaced or repaired shall be proof-tested before use. These tests shall be performed at no less than 100 percent or more than 125 percent of the rated capacity. Underhung hoists that are not an integral part of a supporting structure for lateral movement, such as an overhead crane, must have manufacturer‘s certification indicating the proof test was accomplished with a test load of at least 125 percent of

rated capacity. A record of all tests shall be maintained on the ITD form 756. Refer to ANSI B30.16., Overhead Hoists, for additional information.

2.9.3.5.2. Maintenance and lubrication shall be performed IAW the manufacturer‘s instructions.

2.9.3.6. Safe Operations:

2.9.3.6.1. Lever-operated hoists shall only be used in a direct pull. A sheave or pulley of adequate size shall be used where indirect pulls are permitted by design of the hoist.

2.9.3.6.2. Hoist cable, rope and chain shall not be wrapped around the load. Use only slings or other approved lifting devices.

2.9.3.6.3. Positive action safety latches (mouse) shall be installed on all hooks.

2.9.3.6.4. Hooks shall not be point loaded unless designed for this purpose. All loads shall be seated in the saddle of the hook.

2.9.3.6.5. Extensions to levers (cheater bars or pipes) shall not be used to increase leverage. Extendible levers designed and permanently installed by the manufacturer are authorized.

2.9.3.6.6. Manually operated lever hoists shall only be operated by workers familiar with the use of the equipment. Operator qualifications shall be as determined by the facility and/or shop supervisor or designated representative.

2.9.3.6.7. The rated load shall not be exceeded except for authorized proof tests.

2.9.3.6.8. Hoists shall be attached to well defined dead-end points capable of withstanding the intended load. Note: Lifeline attach points shall not be used for hoists.

2.10. Inspection of Materials.
Prior to movement, material shall be examined for sharp edges, protruding points and weak places. When defects cannot be corrected, additional steps shall be taken to protect the worker. For example, using an enclosed cart when moving sheet metal scraps.

2.11. Personal Protective Equipment (PPE).
Supervisors shall identify the need for PPE for manual material handling tasks. They may use a JSA to accomplish this as necessary (refer to Figure 1.1). The District SCO can assist in this evaluation process. **Chapter 6,** Personal Protective Equipment (PPE), should be consulted when selecting PPE.

2.11.1. Protective footwear shall be provided and worn when there is a reasonable possibility of foot injuries due to heavy or sharp objects and electrical and/or static electricity.

2.11.2. Personnel shall wear leather or leather-palmed gloves when manually handling objects that have sharp or burred edges or splintered surfaces.

2.11.3. Personnel shall carry tools that have sharp edges in protective holders.

2.11.4. Personnel shall wear appropriate protective clothing when transporting, delivering or working with hazardous materials.

2.11.5. Material handlers shall not wear finger rings, jewelry (which includes watches) or loose clothing, and shall keep long hair completely covered when around moving conveyor belts, open rotating shafts or other moving parts of machinery.

2.11.6. Workers shall wear goggles and/or safety glasses with side shields and gloves when cutting strapping. Workers shall stand clear so cut strapping does not contact the face or body. A board or other hold-down device may be used to prevent the strapping from flying out from the material when cut.

2.12. Inspection and Maintenance of Manual Material Handling Equipment (MHE).
Manual MHE, such as hand trucks, wheelbarrows, dollies, pallet jacks and similar un-powered equipment, shall be checked visually before use to assure equipment is in operable condition. This equipment shall also be maintained and inspected according to the manufacturer‘s instructions. Any required repairs shall be accomplished prior to use of the equipment.

2.13. Other Safety Requirements.

2.13.1. Stack all materials neatly and arrange them in an orderly manner. Limit the stack height to minimize the possibility for the materials to fall or collapse.

2.13.2. Remove, repair or replace defective or broken strapping on material.

2.13.3. Do not throw materials from elevated places except when using approved chutes. Carry or lower them.

2.13.4. If MHE is not available and drums must be manually moved, roll drums by pushing with the hands, not the feet. Ensure a minimum of two workers set the drum upright.

2.13.5. Do not run when carrying materials.

2.13.6. Practice good housekeeping when unpacking materials. Discard banding, packing materials, and empty cartons properly and do not allow these materials to accumulate in work areas.

Chapter 3 – Driver's License and Authorization

3.1. Operating License Requirements.

3.1.1. No employee will be allowed to operate ITD-owned or leased vehicles or other self-propelled equipment without a valid Idaho Motor Vehicle Driver's License or Commercial Driver's License (CDL) in his or her immediate possession, unless they meet exemption criteria as specified in *Title 49, Chapter 3, Idaho Code, Section 49-302*. To operate any ITD vehicles or equipment, an employee must be at least 18 years of age. A driver's record check will be completed before offering a position.

3.1.2. For a position that will require the person to operate vehicles or equipment, any applicant is obligated to present a valid driver's license at the time of employment, as required by *Idaho Code, Title 49, Chapter 3*. The hiring authority must indicate the type of license, its serial number, its date of expiration, and any restrictions on the ITD 1211, Supervisor's Request for Department Driving Authorization. The ITD 1211 is sent to Employee Safety & Risk Management (ESRM) for processing. This must be completed before any offer of employment is made.

3.1.3. **Minimum Standards**. Drivers are unacceptable if any of the following violations have occurred:

3.1.3.1. **Within the Last Three (3) Years:**

3.1.3.1.1. Leaving the scene of a personal injury accident

3.1.3.1.2. Four (4) moving violations

3.1.3.1.3. Failure to submit to a chemical test

3.1.3.2. **Within the Last Two (2) Years:**

3.1.3.2.1. Three (3) moving violations

3.1.3.3. **Within the Last Twelve (12) Months:**

3.1.3.3.1. Accumulation of six (6) points

3.1.3.3.2. Driving under the influence of alcohol and/or drugs

3.1.3.3.3. Two (2) moving violations

3.1.4. If the history is satisfactory, either Driver or Operator privileges will be authorized (according to the requirements of the employee's classification and the type of license held).

3.1.5. **CDL Requirements.**

3.1.5.1. Any employee operating equipment in excess of 26,000 pounds, transporting 16 or more people, or transporting hazardous materials must be licensed under the CDL requirements.

3.1.5.2. Any person who will operate vehicles under one of the CDL classifications must obtain a valid CDL of the appropriate class as a condition of employment. Higher classes and proper endorsements must subsequently be obtained as required for compliance with the CDL law.

3.1.5.3. Failure to obtain or maintain the proper CDL along with the proper endorsements required by the job will result in appropriate action, up to and including dismissal.

3.1.5.3.1. Under certain circumstances an ITD employee may have their ITD vehicle driving privileges temporarily suspended pending the outcome of an investigation relating to their operation of a motor vehicle.

3.1.5.3.2.Circumstances that may lead to temporary suspension include, but are not limited to; arrest and citation for driving under the influence, an Administrative License Suspension, citation for reckless driving, unsafe acts while operating ITD vehicles or equipment , vehicle safety incidents or violation of ITD vehicle use policies.

3.1.5.3.3. At the discretion of the supervisor, employees may be assigned non-driving duties pending outcome of the investigation and/or conclusion of civil or criminal litigation or administrative action.

3.1.5.3.4. If a court or ITD DMV finds grounds for suspension of driving privileges, ITD will suspend the employee's ITD vehicle driving privileges until the license is reinstated. If the employee is in a position that requires a driver's license as a condition of employment and their license is suspended for any period of time, they may be subject to disciplinary action, up to and including dismissal. If the investigation or court proceedings clear the employee of wrongdoing or the litigation does not result in suspension of driving privileges and the employee's driving privileges are reinstated, the employee will be allowed to return to operating ITD vehicles.

3.1.5.3.5. Under certain circumstances an ITD employee may have their ITD vehicle driving privileges temporarily suspended pending the outcome of an investigation relating to their operation of a motor vehicle. Circumstances that may lead to temporary suspension include, but are not limited to; arrest and citation for driving under the influence, an Administrative License Suspension, citation for reckless driving, unsafe acts while operating ITD vehicles or equipment , vehicle safety incidents or violation of ITD vehicle use policies. At the discretion of the supervisor, employees may be assigned non-driving duties pending outcome of the investigation and/or conclusion of civil or criminal litigation or administrative action. If a court or ITD DMV finds grounds for suspension of driving privileges, ITD will suspend the employee's ITD vehicle driving privileges until the license is reinstated. If the employee is in a position that requires a driver's license as a condition of employment and their license is suspended for any period of time, they may be subject to disciplinary action, up to and including dismissal. If the investigation or court proceedings clear the employee of

wrongdoing or the litigation does not result in suspension of driving privileges and the employee's driving privileges are reinstated, the employee will be allowed to return to operating ITD vehicles.

3.2. Safe Driver Orientation.

3.2.1. This program is conducted (usually in the first month of employment) by the employee's supervisor. The supervisor or designated individual will have the new employee drive a vehicle and make observations of their capabilities in the specific equipment the employee will operate as part of the job duties. Upon receipt of the ITD-1211, ESRM shall investigate the driving history of the employee by reviewing it as recorded by the Division of Motor Vehicles, Driver Services Section.

3.2.2. The employee is responsible for notifying the immediate supervisor if his/her driver's license is suspended. The Supervisor or DBM must notify the Employee Safety & Risk Management Manager. Requests for restricted driving permits pertaining to ITD employment must be signed by the hiring authority for that employee. When an authorization for work-related driving is made by a judge, a copy is to be sent to ESRM. All disciplinary action must be coordinated through the HR office.

3.3. Reinstatement/Reemployment.

3.3.1. In all cases of reinstatement and reemployment, the employee's current driver record will be checked by ESRM before driving privileges are authorized.

Chapter 4 – Alcohol and Drug Free Workplace

4.1. General Information.
The Idaho Transportation Department is committed to the safety of the traveling public as well as the health and safety of its employees. Alcohol and drug misuse by employees adversely affects job performance and the working environment. The protection of employees and those they serve is of utmost priority. Therefore, the Department considers it necessary to the integrity and safety of its programs and activities to have a workplace free from alcohol and drug misuse.

4.1.1. This policy is in compliance with the Drug-Free Workplace Act of 1988, Federal Motor Carrier Regulations, federal and state laws, and the Division of Human Resources rules.

4.1.2. The Department has established the following:

4.1.2.1. Pre-employment Drug Testing

4.1.2.2. Reasonable Suspicion Alcohol and Drug Testing

4.1.2.3. Commercial Driver's License (CDL) and Safety-Sensitive Random Alcohol and
4.1.2.4. Drug Testing

4.1.2.5. Post-Accident Testing

4.1.3. All drug and alcohol testing shall be conducted in accordance with Federal Motor Carrier Safety Regulations 49 CFR Parts 40 and 382 or CFR 14 Part 120, FAA Drug and Alcohol Testing Program.

4.2. Pre-Employment Drug Testing For Safety Sensitive Positions.
4.2.1. Appointments to those positions designated as safety-sensitive will be contingent upon the selected candidate successfully complying with this policy and obtaining a negative result on a pre-employment drug test. Pre-employment drug testing is required of successful applicants for the following identified safety-sensitive positions:

4.2.1.1. Commercial driver's license holders

4.2.1.2. Avalanche technicians

4.2.1.3. Incident response technicians

4.2.1.4. Pilots

4.2.1.5. Aeronautics mechanics

4.2.2. **General Consent for Limited Queries of the Federal Motor Carrier Safety Administration (FMCSA) Drug & Alcohol Clearinghouse** – When a CDL driver is being hired the candidate must be registered in the FMSCA Clearinghouse in order to consent for ITD to conduct a limited query of the FMCSA Commercial Driver's License Drug and Alcohol Clearinghouse. This is to determine whether drug or alcohol violation information

exists. Candidates must complete the general consent form for information to be released to ITD. This should be done prior to a candidate being offered the position.

4.2.3. **Timing.** Upon being offered a position designated as safety-sensitive, the applicant must report to a designated testing location within 48 hours. An applicant seeking an extension of the reporting period must make a request in writing and shall state reasons for the requested extension. The HR Manager for your District may grant an administrative extension of the 48 hour timeframe. No applicant for an identified safety-sensitive position will be allowed to begin work in that position until they have submitted to a pre-employment drug test and the Department has received confirmation that the applicant has passed the pre-employment drug test.

4.2.4. **Positive Drug Tests or Failure to Comply.** The Department will rescind its conditional employment offer to applicants who test positive or who fail to comply with the testing requirements. Failing to comply includes:

4.2.4.1. Refusing to test

4.2.4.2. Failing to report for testing at the designated location and within the specified timeframe

4.2.4.3. Failing to provide a sufficient sample within three hours after reporting to the testing location (absent a valid medical explanation)

4.2.4.4. Failure to retest within 24 hours after receiving a negative dilute result.

4.2.4.5. Attempting to adulterate or substitute a test sample

4.2.4.5.1. There is a one year waiting period to reapply for a safety sensitive position in the event a test is positive or the applicant fails to comply. In addition to a negative test, the applicant will need to show that they have successfully complied with DOT Rule CFR Part 40 Section 40.305.

4.2.5. **Re-testing.** An applicant who receives a drug test result of ‘negative dilute’ must submit a specimen for retesting within 24 hours, or their original negative dilute test will be considered a positive test.

4.2.6. **Confidentiality and Release of Records.** The third-party contractor providing testing services notifies the ITD Designate Employer Representative (DER) of all test results. The results will be shared with District SCO and/or HR by email. The DER will maintain all results in a confidential file.

4.3. Reasonable Suspicion Alcohol and Drug Testing.

4.3.1. The consumption of alcohol or illegal drugs on the job is strictly prohibited.

4.3.2. Employees shall not report to work or remain at work with alcohol or illegal drugs in their system or under the influence of prescription drugs that may cause impairment.

4.3.2.1. The unlawful manufacture, distribution, dispensing, possession or misuse of alcohol or illegal drugs is prohibited in any Department workplace. The workplace is defined as any building, property, vehicle, or equipment owned, leased, or otherwise used to conduct Department business.

4.3.2.2. All employees are expected to report to work, and remain at work, free from influence of alcohol or controlled substances caused by the use of drugs or alcohol, including unlawful use of prescription drugs. The unlawful manufacture, distribution, possession or use of alcohol and/or controlled substances is prohibited. Any employee who is made aware of or suspects any unlawful activity to be taking place on ITD property, shall report the matter to a supervisor or Human Resources.

4.3.3. **Cause for Reasonable Suspicion Testing.** Reasonable suspicion testing is required when a co-worker or supervisor observes behavior based on specific, current, and articulable observations concerning the appearance, behavior, speech, or breath odors of an employee. The observation may include indications of the chronic or withdrawal effects from use of drugs or alcohol, or the presence of drugs and/or drug paraphernalia. These observations must be documented by the supervisor on form 2813 (Observed Employee Behavior - Reasonable Suspicion Record) as soon as reasonably possible. The possession of alcohol by itself does not constitute justification for reasonable suspicion testing, but it should give supervisors cause to further inquiries to the employee.

4.3.4. **Supervisor Responsibilities.** The supervisor is expected to follow the reasonable suspicion procedures as outlined:

4.3.4.1. Observe the employee.

4.3.4.2. If the supervisor has suspicions that the employee is under the influence of alcohol or controlled substances, the employee must be relieved of all duties.

4.3.4.3. The supervisor should obtain confirmation of reasonable suspicion from another supervisor who is present at the work site or who can arrive within 30 minutes of the initial supervisor's observation.

4.3.4.3.1. If the supervisor is not able to obtain confirmation from another supervisor within 30 minutes of initial observations, the supervisor should order the test anyway.

4.3.4.3.2. The supervisor must notify their immediate supervisor as soon as reasonably possible.

4.3.4.3.3. If the immediate supervisor is not available, then the next level higher supervisor should be notified.

4.3.4.3.4. Continue working up the chain of command until a higher level authority is reached.

4.3.4.3.5. If no higher authority is reached, the process must continue. **Inability to reach a higher level supervisor does not halt this process or impact its timing.**

4.3.4.3.6. As soon as possible, the Operations Engineer and DE must be notified for Maintenance and Operations Personnel.

4.3.4.4. The supervisor shall meet with the employee in a private area and inform them of their suspicions and the reasons behind them; and that the employee is to be taken for a reasonable suspicion drug and/or alcohol test.

4.3.4.4.1. It is preferable that the supervisor has another supervisor present during this meeting, but if that is not feasible then the process must proceed.

4.3.4.4.2. The employee must be told that refusal to test counts as a positive test.

4.3.4.4.3. If the employee refuses the test, they are to be taken home by the supervisor, another employee, friend, family member, or a law enforcement official. They must not be allowed to drive ITD equipment or vehicles or drive themselves in any other vehicle.

4.3.4.4.4. If an employee insists upon leaving the facility anyway, do not physically restrain them, but call law enforcement and inform them of the situation, including the employee's name, vehicle model and license plate number.

4.3.4.5. The employee shall be escorted by the supervisor, security, or other appropriate employees, to the test site. It is preferable that a second individual, such as the second supervisor who conducted the second observation, is there to help escort the employee. If the reasonable suspicion falls after-hours, contact our drug and alcohol contractor at 1-800-310-0036. They will be able to assist in getting the collection.

4.3.4.6. The supervisor shall complete the Non-DOT Drug/Alcohol Test Authorization Form found on the Safety SharePoint site. This form must be taken to the test site by the escort. It may be completed at the test site.

4.3.4.7. Once the employee has submitted to the test, the supervisor must either take the employee home or arrange for someone to pick the employee up from the workplace. The employee must be informed that they are now on paid administrative leave pending the results of the test.

4.3.4.8. If the test is performed during normal business hours, please notify District SCO that this test is being conducted. If after hours, notify District SCO at the first opportunity.

4.3.4.9. As soon as reasonably possible, the supervisor must complete the Reasonable Suspicion Form 2813. This form should be submitted to the observing supervisor's immediate supervisor and to District SCO as soon as possible.

4.3.4.9.1. The supervisor may be subject to disciplinary action, up to and including dismissal for failure to follow reasonable suspicion procedures, when applicable.

4.3.5. **Timing of Reasonable Suspicion Testing.** A supervisor or designee should take the employee to be tested within two (2) hours, but no more than 8 hours, of being aware of the reasonable suspicion.

4.3.6. **Pay Status.** An employee required to submit to reasonable suspicion testing will be placed on suspension for investigation, leave-with-pay, until results of the test are known.

4.3.7. **Positive Tests or Failure to Comply.** Employees are subject to disciplinary action, up to and including dismissal, if they:

4.3.7.1. Test positive for any of the prohibited drugs* and/or have a blood alcohol level of 0.02 or greater.

4.3.7.2. Engage in conduct prohibited by this policy.

4.3.7.3. Fail or refuse to submit to testing. "Fail or refuse to submit to testing" means that the employee:

4.3.7.3.1. Fails or refuses to take a required alcohol breath test or required drug test.

4.3.7.3.2. Does not report to the collection site when required.

4.3.7.3.3. Does not provide an adequate breath sample for alcohol testing or adequate urine sample for drug testing without a valid medical explanation after receiving notice of the requirement for testing.

4.3.7.3.4. Engage in conduct that clearly obstructs the testing process, including but not limited to altering or attempting to alter a test sample by adding a foreign substance or submitting a test sample that is not his or her own.

4.3.7.4. Failure or refusal to submit to testing, as listed above, will be treated as if the employee tested positive. If there is a legitimate medical reason (for example, the positive result is due to an employee taking a medication prescribed to them by a licensed physician) the employee will need to correspond with the Medical Review Officer (MRO) to provide copies of a valid prescription for the drug in question, in which case the MRO will report a negative result to ITD.

4.3.7.4.1. Prohibited Drugs: Marijuana metabolites/THC; Cocaine Metabolites (including crack); Amphetamines (including methamphetamine and MDMA, also known as Ecstasy); Opiates (including codeine, heroin, morphine); Phencyclidine (PCP)

4.3.8. **Test Results and Outcomes.** Test results are provided to the Department's Employee Safety and Risk Management section.

4.3.8.1. If an employee's test result is negative, the Department will notify the employee of the test result and make arrangements to return the employee to work.

4.3.8.2. If the employee's test result is positive, the Department will notify the employee.

4.3.8.3. Employees who test positive will be subject to disciplinary action, up to and including dismissal.

4.3.8.4. Employees have the right to be re-tested (original sample) and must do so within seven (7) working days of being informed of a positive test result. The test will be performed at the employee's expense.

4.4. Commercial Driver's License and Safety Sensitive Positions Random Alcohol and Drug Testing.

4.4.1. Selected positions within the department require that the employee hold a Commercial Driver's License (CDL). The determination is based on job duties required by the Department. Safety Sensitive positions are defined in 4.2.

4.4.1.1. **Note:** An employee called upon to utilize their Commercial Driver's License for ITD, even if only once in a year, must be in the DOT drug testing pool before they perform any safety sensitive functions.

4.4.2. **Procedure**.

4.4.2.1. The Department provides the names of employees holding Commercial Driver's Licenses or positions identified as Safety Sensitive to a third party contractor who puts the employees in a random drawing. These procedures are in accordance with Department of Transportation (DOT) regulations.

4.4.2.2. The third party contractor notifies the Employee Safety and Risk Management section of the names of the employees who have been randomly selected.

4.4.2.3. Safety and Risk Management notifies District SCO.

4.4.2.4. District SCO will complete a DOT Authorization Form and give it to the supervisor to notify employee of test.

4.4.2.5. Once the employee is notified, they must report to the collection site within two hours.

4.4.2.6. Test results are provided to Employee Safety and Risk Management.

4.4.3. Positive Drug Tests and Failure to Comply.

4.4.3.1. Employees who receive a positive drug test or fail to comply may be disciplined, up to and including dismissal.

4.4.3.2. Failing to comply includes:

4.4.3.2.1. Refusing to test

4.4.3.2.2. Failing to report for testing at the designated location and within the specified timeframe

4.4.3.2.3. Failing to provide a sufficient sample within three hours after reporting to the testing location (absent a valid medical explanation)

4.4.3.2.4. Attempting to adulterate a test sample

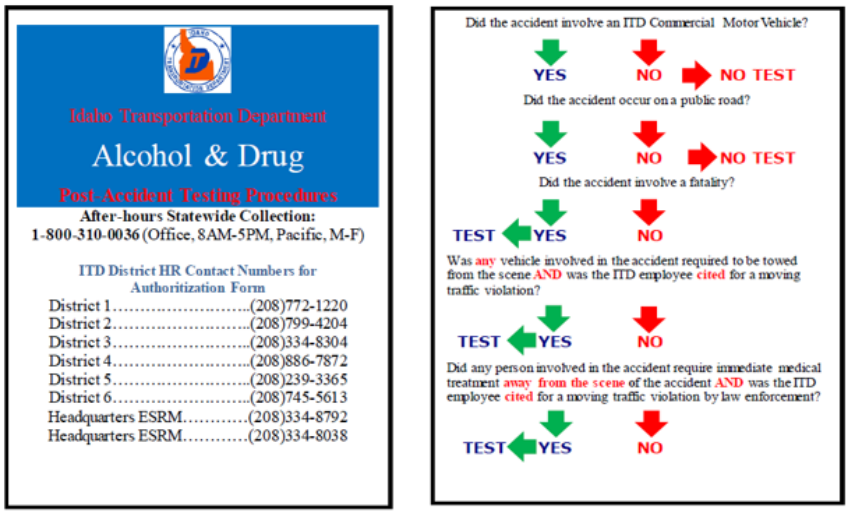
4.5. Post-Accident Alcohol and Drug Testing.

4.5.1. Any employee falling under the Commercial Driver's License or Safety Sensitive position definitions in paragraph 4.2 will be tested following an accident according to FMCSA procedures, which are outlined in the flow chart below.

4.5.1.1. If the accident was in an ITD **non-commercial** vehicle you are not required to test.

4.5.1.2. If the accident occurred in a **non-commercial** vehicle OR **safety sensitive** position and you choose to test, you must use a Non-DOT Drug/Alcohol Test Authorization Form.

Figure 4.1.



Chapter 5 – Hazard Communication

NOTE

Compliance with this safety manual is mandatory for all ITD employees. The practices outlined in this manual are designed to keep ITD employees safe from injury while on the job. This content, procedures and best practices are gleaned from various industry standards. In the interest of keeping this manual short, some guidance and procedures are referenced to other outside sources including OSHA standards. This does not indicate that ITD follows OSHA in all instances, or that OSHA standards apply to the State of Idaho. Rather the references in this manual to some OSHA standards is merely an acknowledgment that in certain specific instances OSHA has identified and articulated the best guidance available as a best practice.

5.1. Hazard Communication Standard (HCS).

5.1.1. The purpose of this chapter is to ensure that ITD is in compliance with 29 CFR 1926.59, Hazard Communication Standard (HCS). The HCS establishes methods to evaluate the hazards of all chemicals produced or used in the workplace, and requires information concerning the hazards be transmitted to employers and employees. This program satisfies the federal rule outlining the Employee Right to Know the hazards of the workplace.

5.1.2. The Director is responsible for ensuring that all employees are trained to interpret the dangers of hazardous chemicals; understand the information on the Safety Data Sheets (SDS), and that a list of hazardous chemicals is maintained at each job site. The headquarters Hazardous Materials Coordinator shall organize staff training pertinent to hazardous materials and waste in conjunction with HQ Learning & Development and the District trainers. The Operations Engineer has the overall hazard communication responsibility.

5.1.3. The creation of and maintenance of an accurate chemical inventory not only facilitates smooth operations in a work place, it is also required by 29 CFR 1910.1200, also known as the OSHA Hazard Communication Standard. Ready access to safety data sheets of each hazardous chemical in the workplace is also an essential requirement of this standard.

5.1.4. Section 1910.1200(a)(2) of the OSHA Hazard Communication Standard states that "This occupational safety and health standard is intended to address comprehensively the issue of classifying the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, and to preempt any legislative or regulatory enactments of a state, or political subdivision of a state, pertaining to this subject. Classifying the potential hazards of chemicals and communicating information concerning hazards and appropriate protective measures to employees, may include, for example, but is not limited to, provisions for: developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present; labeling of containers of chemicals in the workplace, as well as of containers of chemicals

being shipped to other workplaces; preparation and distribution of safety data sheets to employees and downstream employers; and development and implementation of employee training programs regarding hazards of chemicals and protective measures".

5.1.5.The OSHA Hazard Communication Standard also requires chemical manufacturers, distributors, and importers to communicate the hazards of chemical products to users by providing Safety Data Sheets SDSs for all chemical in-use and stored in the workplace must be readily accessible to all employees at all times. These SDSs are designed to provide essential hazard and protective measures information to chemical users and emergency responders.

5.1.6. Any accident or incident involving a chemical will require a SDS being provided to emergency personnel and to the attending physician so proper treatment can be administered.

5.2. Requirements for Inventory.

5.2.1. The Supply Services Manager will maintain a list of the hazardous chemicals used by ITD employees and update the list as necessary. The list of hazardous chemicals shall be in the Supply Services Management supply catalog and on-site in the SDS binders at various locations (including District Supply, Mechanic Shops, Vegetation Crews, Striping Crews, Bridge Crews, Aviation Hangers & Maintenance bays, Materials Labs and Maintenance Sheds). The hazardous chemical list will be updated upon receipt of hazardous chemicals.

5.2.2. To develop and maintain your chemical inventory:

5.2.2.1. Download the ITD chemical inventory template below.

5.2.2.2. Using the template, enter the minimum information required: chemical name, CAS# if available (some proprietary mixtures may not have it) and amount (quantity and unit)

5.2.2.3. Update as new chemicals come in or as chemicals are used or discarded

ls-chemical-inventory-template.xls

5.3. Safety Data Sheets (SDS).

5.3.1. Supply Services and District Supply Operations will maintain a file of SDS covering every substance on the list of hazardous chemicals used by ITD employees in their District. The SDS will include all of the information required by the HCS. The SDS will be readily available to all employees. Supply Services personnel shall review the SDS, check for completeness, and accept/reject the product for use by ITD employees. Users are responsible for acquiring an SDS from Supply when they order a product. Supervisors must ensure that

the SDS is available in the workplace for each employee to read if the employee is going to use or work with a product.

5.1.2.1. To maintain ready access to safety data sheets:

5.1.2.1.1. Maintain printed copies of SDS for ALL chemicals stored and/or used in the workplace in the SDS binder.

5.1.2.1.2. Upon receipt of a chemical shipment, take the enclosed SDS and place in a SDS binder. If no SDS is enclosed, visit the website of the manufacturer and print the SDS for the chemical received. Arrange SDS alphabetically according to chemical name.

5.1.2.1.3. Place tabs for each letter of the alphabet to facilitate SDS search in the binder.

5.1.2.1.4. Indicate the location of SDS binder on ITD Chemical Inventory

5.1.2.1.5. Place SDS binder in a work area accessible to all personnel at all times.

5.1.2.1.6. In case of an accident involving a chemical, provide the SDS of that chemical to the emergency responder and the attending physician.

5.4. Labels and Other Forms of Warning.

5.4.1. The supervisor will ensure that all hazardous chemicals on the job site are properly labeled. Labels should list the chemical identity; appropriate hazard warnings; and the name and address of the manufacturer, importer, or other responsible party. Small containers of materials used during a work shift do not require labels. To meet the labeling requirements for other in-house containers, refer to the label supplied by the manufacturer. Labels shall be checked on a regular basis. Illegal or missing labels shall be replaced. The corresponding SDS should be referred to for more complete information.

5.5. Training and Information.

5.5.1. Each employee who works with or is potentially exposed to hazardous chemicals will receive initial training on the HCS and the safe use of hazardous chemicals *(5.25 Hazardous Materials Module 1 'Employee Awareness)*. The Hazardous Material Coordinators conduct hazardous chemicals/waste training. The training and information provided shall include:

5.5.1.1. Summary of the standard and the purpose and location of the written information.

5.5.1.2. Hazardous chemical properties, including visual appearance and odor, and methods that can be used to detect the presence or release of hazardous chemicals.

5.5.1.3. Physical and health hazards associated with potential exposure to workplace chemicals.

5.5.1.4. Procedures to protect against hazards, e.g., personal protective equipment, work practices, and emergency procedures.

5.5.1.5. Hazardous chemical emergency procedures.

5.5.1.6. Where Safety Data Sheets (SDS) are located, how to understand their content, and how employees may obtain and use appropriate hazard information.

5.5.1.7. How to read labels and review MSDS to obtain appropriate hazard information.

5.5.1.8. The employee's attendance shall be recorded on the computerized Training Records System.

5.5.2**. Site Specific Hazard Communication Plan**.

5.5.3.1 Each supervisor will provide site specific training to employees in their work groups.

5.5.3.2 This site specific training will include:

5.5.3.2.1. Location and availability of the work group's written HCP

5.5.3.2.2. Location of SDS sheets in the work area

5.5.3.2.3. Proper labeling of containers (original & secondary)

5.5.3.2.4. Site specific Chemical Hazard Assessments

5.5.3.2.5. Proper Personal Protective Equipment for the work site as well as its proper use & limitations

5.5.3.2.6. Emergency procedures

5.5.3.2.7. Methods and observation techniques to determine the presence or release of hazardous chemicals if applicable

5.5.3.2.8. Retraining is required when changes in the workplace, processes, or types of PPE to be used render previous training obsolete

5.5.3.2.9. The supervisor will provide additional training to employees whenever a new hazard is introduced into their work areas

5.6. Hazardous Non-routine Tasks.

5.6.1. Periodically, employees perform hazardous non-routine tasks such as confined space entry (See chapter 15 of the Safety Manual for specific instructions for confined space entry), tank cleaning, and lead paint removal

5.6.2. Prior to starting work on such projects, each affected employee will be given information by the site supervisor about the hazardous chemicals that may be encountered and protective procedures to be used. This information will include the specific hazardous chemical; the SDS; protective clothing and equipment; the safety measures to be taken; and the steps being used to reduce the hazards, including ventilation, respirators and the presence of another employee for emergency procedures.

5.7. Fetal Protection Information.

5.7.1. Those employees, both male and female, contemplating having a child should be aware of the potential hazards from exposure to toxic chemicals or radiation. Pregnancy will not constitute grounds for dismissal due to failure to perform those duties that may endanger the health of the unborn child. When an employee suspects or confirms a pregnancy, the employee's supervisor should be notified immediately and an appointment made for consultation with Safety Compliance Officer for districts or the ESRM for headquarters.

5.7.2. Modification of the employee's job duties that involve potential exposure to hazardous materials for the duration of the pregnancy will be determined on a case-by-case basis.

5.8. Additional Information.

5.8.1. Further information on written hazardous chemical information, hazardous waste procedures, and applicable SDS is available from the headquarters' Hazardous Materials Coordinator (Operations Maintenance Section) or one of the District Hazardous Materials Coordinators.

5.9 Sample Hazard Communication Program (HCP).

This is a fillable template that the employer must complete. Instructions in red font enclosed in brackets indicate where you must enter your worksite-specific information. In addition, you must complete the tables, including addition of more table cells as needed.

- Hazard Communication (HazCom) Program for [District and Location]

Date: [Type the date of last review]

As required by Occupational Safety and Health Administration Regulation 29 CFR1910.1200, ITD has developed this Hazard Communication Program (HazCom), which is implement and maintained as an important component of our Injury and Illness Prevention Program to enhance our employees' health and safety. The Employee Safety and Risk Manager with the assistance of the District Safety Compliance Officer act as the department Hazard Communication Program managers, and have full authority and responsibility for implementing and maintaining this program.

Our goal is to provide information to all personnel on our worksite — including other employers and their employees — about the hazardous chemicals in our workplace, the associated hazards, and the control of these hazards through a program that includes the elements listed below.

List of hazardous chemicals

[Type the name of person or position here] [appointed by the supervisor or foreman] will prepare and keep current a list of all known hazardous chemicals present in our workplace that are in use or storage (see attached *Hazardous Chemical List*) and, at the same time, verify that we have the most current safety data sheets (SDSs). The product identifiers listed will match those on the corresponding container labels and SDSs. Specific information on each noted hazardous chemical can be obtained by reviewing the corresponding label and SDS.

Safety Data Sheets (SDSs)

[Type the name of person or position here] is responsible for obtaining the SDSs corresponding to our *Hazardous Chemical List*, reviewing them for completeness, and maintaining the safety data sheet system for our company.

Should a SDS not be received with or prior to receipt of the initial shipment of a hazardous chemical, or with the first shipment after a safety data sheet is updated, a SDS will be requested as soon as possible from the District Supply office, manufacturer or distributor.

If a new or revised SDS is received that indicates significantly increased risks or measures needed to protect employee health, that information will be conveyed to employees within 30 days by [Provide the site-specific procedures].

If we become aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information will be added to the SDS within three months.

Legible SDS copies for all hazardous chemicals to which employees of this company may be exposed are kept in [Describe procedures that will ensure that they are readily accessible during each work shift to employees when they are in their work area(s). Electronic access and other alternatives to maintaining paper copies of the safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options]. SDSs are readily available for review by all employees in their work area and during each work shift without the need to ask someone.

Employees are to contact District Safety Compliance Officer if they have a specific question or need additional information on a SDS.

SDSs (and the older Material Safety Data Sheets) constitute an employee exposure and medical record and identity the Toxic Substance or Harmful Physical Agent to which employees are exposed to and must be maintained by ITD for 30 years after the last day of its use.

Labels and other forms of warning

Before hazardous chemical containers are released to the work area, it is ITD's policy that [Provide name of person or position] will verify that all containers are properly labeled as follows.

- Original containers received from the manufacturer, distributor, importer:
    - Product identifier
    - Signal words
    - Hazard statements
    - Pictograms
    - Precautionary statements
    - Name, address, and telephone number of the manufacturer, importer, or other responsible party
- Workplace containers where the contents of the original containers received from the manufacturer, distributor, importer have been transferred into one of our own containers:

[Describe how these containers will be labeled. The options are to duplicate the original container label, which must include the information listed above, or provide the:

- Product identifier
- Words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical]

We will not remove or intentionally deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

Portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer are not required to be labeled.

[Provide name of person or position] will utilize the following procedures to review and update label information when necessary: [Describe procedures]

If we become newly aware of any significant information regarding the hazards of a chemical, we will revise the labels for the chemical within six months of becoming aware of the new information.

Employees will receive additional training as soon as possible when a new hazard is introduced into the workplace or whenever employees might be exposed to hazards at another employer's worksite.

Training will be documented in the Learning Hub.

Chapter 6 – Personal Protective Equipment (PPE)

NOTE

Compliance with this safety manual is mandatory for all ITD employees. The practices outlined in this manual are designed to keep ITD employees safe from injury while on the job. This content, procedures and best practices are gleaned from various industry standards. In the interest of keeping this manual short, some guidance and procedures are referenced to other outside sources including OSHA standards. This does not indicate that ITD follows OSHA in all instances, or that OSHA standards apply to the State of Idaho. Rather the references in this manual to some OSHA standards is merely an acknowledgment that in certain specific instances OSHA has identified and articulated the best guidance available as a best practice.

6.1. General Information.

This chapter implements policy 5560 Personal Protective Equipment and ITD Clothing. Failure to comply with the policy and this chapter may result in disciplinary action. This chapter directs ITD personnel when/where to use, proper use, limitations, care and maintenance for Personal Protective Equipment (PPE) for eyes, face, head, hearing, hands, feet, respiratory system and other work/protective clothing. The provisions of this chapter apply not only to workers involved in the task, but also visitors within the hazard area such as management, supervisors and non-ITD personnel.

6.1.1. Contractor Operations: When ITD employees are within the worksite of a contracted operation they must comply with PPE requirements dictated by the contractor. Conversely even if the contractor does not require PPE, ITD personnel are still required to protect themselves from hazards present at the worksite.

6.1.2. The term “Project Lead” is used generically throughout this chapter to describe the employee responsible for ensuring the safety of the workers. This may be the assigned Project Lead Worker, TOTL or Supervising Engineer/Manager.

6.1.3. Workers shall keep their hands and face clean, change clothes and wash skin contaminated with solvents, lubricants or fuels, and keep hands and soiled objects out of their mouth. After exposure to any contaminant, personnel shall wash their hands before eating or smoking. No food or drink shall be brought into or consumed in areas exposed to toxic materials, chemicals or industrial shop contaminants.

6.1.4. When performing construction, maintenance or industrial work, ITD employees must be suitably attired. The individual employee is responsible for furnishing and wearing standard work clothing i.e. durable long pants, work boots, etc. that will provide adequate protection for the general type of work to which he/she is assigned. Sandals or flip-flops of any style, moccasins, shorts, and naked torsos do not meet required standards. Proper minimum clothing during warm weather consists of long pants and shirts with sleeves, and shoes or boots that cover the foot.

6.1.4.1. Office Employees: ITD employees who typically perform their duties in an office environment should adhere to the employee handbook for proper office attire. However, if office workers visit a worksite, snowplow shed or construction area they should wear rugged attire suitable for industrial areas. While at these worksites wear of PPE will be enforced at the discretion of the Project Lead.

6.2. Responsibilities.

6.2.1. **Employee:** Each ITD employee is responsible for his/her own safety. In addition, each employee shall:

6.2.1.1. Promptly report safety, fire and health hazards to Project Lead, supervisor or manager.

6.2.1.2. Comply with PPE requirements of this Safety Manual and the direction of the Project Lead.

6.2.1.3. Ensure PPE is properly used when required, adjusted to properly fit and maintained in a sanitary and serviceable condition.

6.2.1.4. Notify Project Leads of any changes in medical status which might impair their ability to safely wear PPE (e.g., weight changes, facial scarring, dental changes, disfigurement, fitness including heart or respiratory conditions).

6.2.2. **Project Lead:** The Project Lead is responsible for the safety of all personnel on their worksite.

6.2.2.1. If not already accomplished, the Project Lead shall conduct and document a job safety analysis (JSA) for each task where employees are exposed to hazards. If PPE is required, the Project Lead shall ensure PPE is provided, used and maintained in a sanitary and serviceable condition.

6.2.2.2. Project Leads shall instruct all personnel in the use and care of this equipment and document the job safety training on the ITD1965, Learning Hub or equivalent.

6.2.2.3. Project Leads shall ensure personnel wear properly fitted PPE, when required.

6.2.3. **District Safety and Compliance Officer (SCO):** The SCO will consult with Project Leads to provide assistance in completing the JSA. SCO's will provide guidance on hazard elimination and/or reduction strategies.

6.2.4. **Employee Safety & Risk Manager**: ESRM shall ensure all work centers conduct and document hazard assessments (JSA) to determine if hazards are present and take actions necessary to protect workers from injury, illness or death. The ESRM shall ensure PPE is not used as a substitute for elimination, engineering controls (ventilation, isolating or guarding against hazards), or administrative controls (worker rotation, training), when possible. Only after engineering and administrative controls have been applied to the maximum extent practicable, or until controls can be installed, will PPE be the primary means to protect

personnel against hazards. **Note:** If PPE is required for the performance of a task it shall be provided by ITD.

6.2.5. **Safety PPE and Clothing Committee:** A team, referred to as the Safety Clothing Committee, will approve standards, specifications, colors, fabrics, style, reimbursement limits, and other aspects of all personal protective and safety clothing and equipment while complying with all Federal and State safety requirements. Standards approved by this team may be periodically updated. The team will meet as needed.

6.2.5.1. This team will consist of representatives from Safety and Risk Management, Maintenance, Construction, and Procurement, each having one vote. A District Engineer will serve as non-voting member of the team, except in the event of a tie, and will act as the liaison between the Safety Clothing Committee and the Senior Leadership Team, communicating and championing the decisions of the Safety Clothing Committee to those bodies.

6.3. Requirements.

6.3.1. Safety Outerwear:

6.3.1.1. When to use: All department personnel are required to wear ASI/ISEA 107–2006 Class 3 rated outerwear anytime they are outside a vehicle within the right-of-way or on or near highways or in the vicinity of heavy equipment operations. Safety outerwear is defined as fluorescent yellow-green, shirt, vest, coat, or coverall meeting ANSI Class 3 requirements for visibility, and refers to the outermost layer excluding the hard hat.

6.3.1.1.1. Under special limited circumstances florescent orange color vests may be utilized when needed to contrast with background colors in the environment, such as spring green-up, Aspen tree fall yellow foliage or airfield mowing operations when grass has yellowed.

6.3.1.2. Seasonal Wear: Employees may be issued summer and winter apparel as determined by the supervisor and as specified in the following:

6.3.1.2.1. Summer:

6.3.1.2.1.1. Shirts: Fluorescent yellow-green polyester long or short sleeved shirt meeting ANSI Class 3 high visibility requirements.

6.3.1.2.1.2. Bibs or coveralls: Protective coveralls may be worn but require an ANSI Class 3 vest while working within the right of way unless the coveralls meet fluorescent yellow-green ANSI class 3 high visibility requirements.

6.3.1.2.1.3. Footwear: Warm weather with safety toe.

6.3.1.2.1.4. Jackets or rainwear: Fluorescent yellow-green meeting ANSI Class 3 high visibility requirements.

6.3.1.2.2. Winter: Cold weather clothing may be issued for field employees whose job exposes them to prolonged periods of inclement weather. An employee may only request either insulated coveralls or a coat and bib/pants combination when ordering winter apparel.

6.3.1.2.2.1. Insulated bibs or coveralls: Protective coveralls may be worn but require a ANSI Class 3 vest while working within the right of way unless coveralls meet fluorescent yellow-green ANSI Class 3 high visibility requirements.

6.3.1.2.2.2. Cold weather coats/pants: Fluorescent yellow-green ITD issued meeting ANSI Class 3 high visibility requirements.

6.3.1.2.2.3. Footwear: Cold weather insulated with safety toe

6.3.1.2.2.4. Avalanche crew members will be reimbursed according to Financial Services guidance for avalanche specific PPE to include winter clothing, footwear and equipment.

6.3.1.3. Mechanics, shop personnel, and other authorized employees may be issued appropriate winter or summer protective clothing as approved by their supervisor.

6.3.2. Eye and Face Protection:

6.3.2.1. When to Use: Personnel shall use appropriate eye or face protection when exposed to hazards from flying particles, molten metal, liquid chemicals, corrosives, caustics, chemical gases, vapors and bright sunlight, as directed by equipment owner's manual, Safety Data Sheet, USDA Chemical Label or JSA. Selection shall be based on the type and degree of hazard present. Eye protection is required to protect against small particles of falling debris whenever a task is above eye level and the worker must look up into the area being worked on.

6.3.2.2. Proper Use: Eye and Face Protection equipment must meet the following minimum requirements:

6.3.2.2.1. Provide adequate protection against the particular hazards for which they are designed.

6.3.2.2.2. Be reasonably comfortable when worn under designated conditions.

6.3.2.2.3. Fit snugly without interfering with movement or vision of wearer.

6.3.2.2.4. Be durable.

6.3.2.2.5. Be capable of being disinfected (unless disposable items are used).

6.3.2.2.6. Be easily cleaned.

6.3.2.2.7. Be kept clean and in good repair.

6.3.2.2.8. Have the manufacturer‘s identification clearly marked on the equipment indicating compliance with ANSI Z87.1 requirements.

6.3.2.2.9. Metal framed eyeglasses shall be secured with a cord or strap to prevent them from falling off the face when working around or over energized circuitry.

6.3.2.2.10. Normal street frames with safety lenses are not acceptable substitutes and shall not be worn as a substitute for safety spectacles.

6.3.2.2.11. Employees who wear prescription lenses can wear eye protection that incorporates the prescription in its design or shall wear eye protection that can be worn over the prescription lenses.

6.3.2.2.12. The protective equipment must not interfere with vision or proper position of other protective equipment.

6.3.2.2.13. Contact lenses alone do not provide eye protection and shall not be worn in eye hazard work environments without the use of appropriate safety eyewear.

6.3.2.2.14. When working with potentially injurious light radiation, affected employees shall wear PPE with filtered lenses that have a shade number appropriate to the protection required. Refer to **Chapter 14** Welding, Cutting and Brazing in this manual for additional information.

6.3.2.2.15. Face Shields may be worn as primary protection for impact hazards. Face shields may also be used for secondary protection for splash hazards. If face shields are worn for splash (liquid) protection, splash-proof goggles must also be worn underneath as primary protection.

6.3.2.2.16. Eye protection with pitted or scratched lenses that reduce visibility shall be removed from service and discarded.

6.3.2.3. Limitations: Normal sunglasses are not rated as compliant with ANSI 87.1 and shall not be worn as safety glasses. Tinted safety glasses (sunglasses) shall not be worn for protection from potentially injurious light radiation from welding, brazing or cutting operations.

6.3.2.4 Care & Maintenance: Workers shall clean lenses as frequently as necessary to maintain good vision. Dirty lenses can reduce vision and contribute to an incident. Previously used PPE shall be disinfected before reissue to another worker. The most effective method is to disassemble the goggles or spectacles and thoroughly clean all parts with soap and warm water. Carefully rinse all traces of soap and replace defective parts with new ones.

6.3.2.5. Prescription Safety Eyewear: ITD will reimburse according to Financial Services guidance for ANSI Z87.1 approved prescription safety eyewear. This benefit does not cover the cost of eye exams. Employees are responsible for the initial payment of their glasses and, once the purchase has been approved by the District SCOr, they will be

reimbursed according to financial services guidance. All frames must have permanent fixed side shields or wrap-around lenses that meet ANSI Z87.1 standards.

6.3.2.5.1. New glasses will be provided every other fiscal year or when a prescription changes. Glasses damaged during the course of work will be replaced as determined by the supervisor and the District Safety Officer. If the damage is the result of employee negligence, replacement cost will be the responsibility of the employee.

6.3.2.6. Applicable Standards: ANSI Z87.1. Occupational and Educational Eye and Face Protection.

6.3.3. Safety Helmets (Hard Hats):

6.3.3.1. When to Use: Personnel in areas where there is a potential for injury from falling or flying objects, bumping head against a fixed object, within the working arc of heavy machinery, as directed by equipment owner's manual, JSA or when exposed to electrical shock/burns, shall wear protective helmets. Project Leads shall ensure all employees exposed to head hazards wear an approved hard hat at all times in a head hazard zone when outside a vehicle. Some of the specific activities requiring a hard hat:

6.3.3.1.1. While doing sign work with tools and materials overhead.

6.3.3.1.2. When working around or under bridges.

6.3.3.1.3. When working around or with any power tools such as jackhammers, drills, saws, etc., that may cause flying debris.

6.3.3.1.4. When working on or around poles, or overhead structures.

6.3.3.1.5. When performing building demolitions.

6.3.3.1.6. When involved in brush cutting/chipping or tree cutting/trimming operations.

6.3.3.1.7. In the immediate vicinity or working arc of any piece of equipment that has external moving or working parts over shoulder height, such as a backhoe, boom truck, aerial lift, auger truck, front-end loader, overhead crane, dragline, bulldozer, post pounder and stump or brush chipper.

6.3.3.1.8. While outside a vehicle in an active rock/land/mud slide or avalanche area

6.3.3.1.9. In excavations, trenches, manholes, or catch basins where there is a depth of 1.2 m (4 feet) or more.

6.3.3.1.10. When present at any work activity where the authority having jurisdiction or control of the premises requires that hard hats be worn by all personnel, including inspectors and observers.

6.3.3.1.11. Flagging operations when overhead hazards are present.

6.3.3.1.12. Hard hats need not be worn when operating or riding inside a vehicle cab. However, hard hats must have a secure place in the vehicle so they will be available

upon dismounting. Because work assignments may change during the day, each employee who is required from time-to-time to wear a hard hat shall carry a hard hat when leaving the office or maintenance building to begin the day's work. This will ensure the hard hat is available if needed.

6.3.3.2. ITD strongly recommends that workers affected by this policy voluntarily wear hard hats in all construction and maintenance activities. ITD also requests that hard hats or similar high visibility caps be worn anytime outside the vehicle and within the highway operating right of way to enhance added visibility to motorists and as part of the commitment to “think safety first”.

6.3.3.3. Proper Use: Safety helmets (hard hats) provide protection from impact and penetration of falling objects and from high-voltage electric shock and burns. Main helmet components consist of a protective shell, inside suspension system designed to act as an energy-absorbing mechanism and a chinstrap to secure the helmet to the head. The chinstrap shall be worn during work aloft. Selection shall be based on the ANSI Safety Helmet Classification.

6.3.3.3.1. Type I (Impact Type). Type I helmets reduce the force of impact from a blow to the top of the head.

6.3.3.3.2. Type II (Impact Type). Type II helmets reduce the force of impact from a blow received off center or to the top of the head.

6.3.3.3.3. Class G. (Electrical – General). Class G helmets reduce the danger of contact exposure to low voltage conductors.

6.3.3.3.4. Class E (Electrical). Class E helmets are intended to reduce the danger of exposure to high voltage conductors.

6.3.3.3.5. Class C (Conductive). Class C helmets do not provide protection against contact with electrical conductors.

6.3.3.3.6. ITD Employees shall wear only blaze orange safety or high-visibility yellow color helmets. Painting helmets is not permitted.

6.3.3.3.7. Helmets may be worn with the bill to the rear if approved by the manufacturer. See owner’s manual. If approved to be worn backward, the head harness must be reversed inside the helmet, so the size adjuster remains on the back of the head.

6.3.3.3.8. Identification markers may be attached on shells without making holes through the shell and without the use of any metal parts or metallic labels. (Holes could cause the helmet to fail the electrical insulation test and degrade the impact design of the helmet.) Helmet markings shall not obscure the manufacture’s name, ANSI designation and class.

6.3.3.3.9. Decals on safety helmets are only authorized if approved by the Project Lead.

6.3.3.3.10. Do not place objects inside safety helmets between the shell and suspension device. This space is designed so the impact force is not transmitted to the wearer‘s head.

6.3.3.3.11. Do not drill ventilation holes in safety helmets.

6.3.3.3.12. Do not deliberately drop, throw or otherwise abuse helmets as this causes them to lose their protective qualities

6.3.3.3.13. Keep helmets reasonably free of abrasions, scrapes and nicks. Replace worn or damaged helmets as required.

6.3.3.3.14. Do not store helmets long-term in direct sunlight or where exposed to extreme heat as this may degrade the degree of protection offered.

6.3.3.3.15. Chinstraps shall be used when working on elevated surfaces where there is a possibility of the hard hat falling off and impacting workers on the lower level.

6.3.3.4. Inspection:

6.3.3.4.1. Inspect safety helmets prior to each use. Remove the helmet from service if it has any of the following defects:

6.3.3.4.1.1. Reject a helmet if the suspension system shows evidence of material cracking, tearing, fraying or other signs of deterioration.

6.3.3.4.1.2. Do not use any helmet with cracks, perforations of brim or shell, deformation of shell or evidence of exposure to excessive heat, chemicals or radiation. Hconstructed of polymer plastics are susceptible to damage from ultraviolet light and gradual chemical degradation. This degradation first appears as a loss of surface gloss called chalking, and with further deterioration, the surface will begin to flake away.

6.3.3.4.1.3. Inspect for any accumulation of conductive material on or inside the shell that cannot be removed prior to use in electrical hazardous environments.

6.3.3.4.2. Expiration Date: Manufacturers imprint the date of manufacture in the inside of all helmets. The manufacture instructions advise the hat expires after 5 years. ITD recommends employees use a permanent marker to write the date helmet is placed in service inside the helmet and discard the helmet 5 years after that date.

6.3.3.5. Maintenance:

6.3.3.5.1. Shells may be scrubbed with a mild detergent and rinsed in clear hot water. After rinsing, carefully inspect the shell for any signs of damage. Dry with clean soft cloths or air dry. If the use of a solvent is necessary to remove tars, paints, oils or other materials, the manufacturer instructions shall be consulted since some solvents may damage the shell.

6.3.3.6. Applicable Standards: ANSI Z89.1., Personal Protection – Protective Headwear for Industrial Workers.

6.3.4. Hair Protection (including facial hair):

6.3.4.1. Men and women who work around chains, belts, rotating devices, suction devices, blowers, etc., shall cover their hair, especially long hair, to prevent it being caught in moving equipment. While such equipment is normally guarded, long hair can fit between the mesh of guards and be drawn into the moving parts.

6.3.4.2. The Project Lead, being most knowledgeable of the operation, shall determine what constitutes an acceptable hair length based upon the JSA.

6.3.4.3. Bandannas, disposable caps, hairnets and turbans may be used to restrain hair, providing they cover the hair completely and do not themselves present a hazard to the wearer.

6.3.4.4. For reference only see: 29CFR1910.212 Machine Guarding

6.3.5. Hearing Protection:

Exposure to high noise levels can cause hearing loss or impairment, in addition to physical and psychological stress. Specifically designed hearing protection may be required, depending on the type of noise encountered and the auditory condition of the employee.

6.3.5.1. When to Use: Personnel shall use foam ear plugs or ear muffs when exposed to noise hazards greater than 85db over an 8-hour work period or when exposed to noise greater than 90db for short time durations. Project Leads shall document noise hazards on the JSA and determine appropriate hearing protection. Protection selection shall be based on the volume and duration of the noise exposure.

6.3.5.2. Individuals who are frequently or routinely exposed to 85db or higher are encouraged to participate in the hearing conservation program. Refer to Chapter 17 Medical Monitoring of this manual for scheduling annual hearing tests.

6.3.5.3. Proper Use: ITD employees shall wear only approved hearing protection.

6.3.5.3.1. Foam ear plugs must be inserted fully into the ear canal in keeping with the manufacturer's instructions.

6.3.5.3.2. Ear muffs must fit snugly to the side of the wearers head. Long hair, facial hair and sideburns may degrade the effectiveness of ear muffs. In this case ear plugs must be worn.

6.3.5.3.3. A single type of hearing protection may not be adequate for extremely high levels of noise. This may require employees to wear double hearing protection (muffs and plugs).

6.3.5.3.4. Music headphones and ear buds are not considered adequate hearing protection unless certified by the manufacture as hearing protection. Electronic noise

cancelling headphones and communication systems may be worn as hearing protection if certified by the manufacturer as hearing protection. Use of headphones must be approved by the Project Lead.

6.3.5.4. Limitations: Ear plugs and muffs are rated by the manufacture according to their ability to attenuate noise. When noise levels exceeded attenuation levels the operation should be stopped until adequate noise attenuation can be put in place.

6.3.5.5. Care & Maintenance: Foam ear plugs should be used once and then disposed of. Ear muffs should be inspected prior to use to ensure they are not cracked or broken. Clean ear muffs with soap and water when they become soiled.

6.3.5.6. For reference only see: 29CFR1910.95 Occupational Noise Exposure

6.3.6. Respiratory Protection:

Certain classifications of employees are required to pass health assessment and fit testing periodically to assure their fitness to wear a respirator and to monitor their respiratory system. Supervisors must perform a Job Safety Analysis when airborne hazards are suspected to determine if respiratory protection is required. Details for the process of Medical Monitoring are contained in Chapter 17 of this manual. Those employees that may be required to be wear respiratory protection including but are not limited to:

6.3.6.1. Pesticide/Herbicide Applicators (as directed by product label)

6.3.6.2. Bridge Repair and Inspection Crews

6.3.6.3. Asbestos Inspectors

6.3.6.4. Construction Inspectors

6.3.6.5. Assessment and Testing

6.3.6.5.1. Prior to wearing a respirator employees must receive a health assessment. The employee will complete the health assessment questionnaire and provide it to the District Safety Officer. The District Safety Officer will ensure the questionnaires are assessed by a medical authority. In some cases the medical authority may wish to conduct additional tests requiring an office visit.

6.3.6.5.2. Prior to wearing a respirator the employee must be fitted for the face piece they will wear. The District Safety Officer will arrange for employees to be fit tested. Fit testing must be performed initially (before the employee is required to wear the respirator in the workplace) and must be repeated at least annually. Fit testing must also be conducted whenever respirator design or facial changes occur that could affect the proper fit of the respirator.

6.3.6.5.2.1. Employees with facial hair that extends beyond the point where the mask seals to the face will have difficulty passing the fit test. This may require the employee to groom facial hair to pass the fit test. This grooming is considered a

condition of employment for employees who must work in areas with airborne hazards.

6.3.6.6. For reference only see: 29CFR1910.134 Respiratory Protection

6.3.7. Body/Torso Protection:
The torso is the largest exposed area of the body. A variety of protective clothing is available to protect personnel from heat, hot metals, liquids, impacts, cuts, corrosives, caustics and radiation. Items such as vests, jackets, aprons, coveralls and full body suits have been specifically designed for this purpose. Project Leads must consider the hazards involved with an operation before selecting the proper protective equipment, which may be a combination of several different pieces of PPE. For example, cloth coveralls protect wood workers against minor cuts and abrasions; however, coveralls alone would be inappropriate for operating a table saw. The addition of a leather apron and eye protection would be more appropriate.

6.3.8. Hand and Arm Protection:
When an employee‘s hands or arms are exposed to hazards, such as skin absorption of harmful substances, severe cuts, lacerations, abrasions, punctures, chemical burns or harmful temperature extremes, appropriate hand or arm protection shall be provided and used. Long sleeves and gloves shall be worn to protect the hands and arms when hot or sharp materials are handled. Project Leads shall conduct a JSA to help identify the hazard and select appropriate hand protection based on the task to be performed, dexterity required, conditions present, duration of use, frequency, physical stresses, limitations of protective clothing and degree of exposure to identified hazards.

6.3.8.1. Multi-Purpose/Cut Resistant Gloves: These gloves are generally worn to protect the hands from injuries caused by handling sharp or jagged objects, wood or similar hazard-producing materials. These gloves are usually made of cloth material, such as cotton flannel, with leather palms and fingers or synthetic coating. All-leather gloves are also acceptable.

6.3.8.2. Cold Weather Gloves: Winter operations expose operators to extreme temperatures sometimes reaching below 0° F. Winter operators should carry rugged, insulated gloves for use during truck repairs/inspections and tree/rock removal activities.

6.3.8.3. Gloves for Protection against Chemical Hazards: Chemical protective gloves shall be worn by personnel working in laboratories, herbicide mixing and battery shops or where acids, alkalis, organic solvents and other harmful chemicals are handled.

6.3.8.4. For reference only see: 29CFR1910.138(a) Personal Protective Equipment

6.3.9. Electrical Worker’s Clothing and Equipment:
Employees who work in close proximity to live unguarded electrical systems 50 volts or greater or who work directly on energized circuits will be provided and must always wear Arc Flash/Flame Resistant (AR/FR) clothing that complies with ASTM F1506-1994. In addition,

they must perform an Arc Flash Hazard Assessment to determine if additional Arc Flash protective clothing is required. See Chapter 8 Signal and Electrician Safety of this manual for further information.

6.3.10. Safety Footwear:

6.3.10.1 General Requirements:

6.3.10.1.1. Employees exposed to foot hazards will be provided safety footwear at ITD expense. Employees exposed to foot hazards are required to wear the safety toe footwear while on duty. Safety toe footwear is not required in office settings.

6.3.10.1.2 Eligibility: Any employee whose job duties expose them to the potential for foot injury is eligible for safety toe footwear. The following categories define those eligible for the Safety Toe Footwear Program.

6.3.10.1.2.1 Category 1: Operations, maintenance, and construction personnel (defined as TTO, TOTL, TTE, TESL, and other full-time employees involved with summer and winter duties) are eligible for one pair each of summer safety toe footwear and winter safety toe footwear.

6.3.10.1.2.2. Category 2: Shop employees (defined as mechanics, welder/machinists, and shop superintendents), pavement lab and supply personnel are eligible for summer safety toe footwear. These employees who work mainly indoors are permitted to wear low-quarter style shoes with safety toe. If needed to safely perform duties in the winter, winter safety footwear may be authorized by their supervisor.

6.3.10.1.2.3. Category 3: Office personnel whose jobs are predominately in an office environment but frequent (more than five (5) times per year) shops, sheds, or warehouses, will be eligible for Safety Toe Footwear Program.

6.3.10.1.2.4. Category 4: Electricians and other specialized positions will be eligible for safety toe footwear that require special compliance for the position or needs for a specific type of job (i.e. flat bottom safety shoes for testing a fresh plantmix mat).

6.3.10.1.2.5. Category 5: Department of Motor Vehicles (DMV) Port of Entry (POE) employees whose duties are primarily in the ITD right-of-way, or as approved by the employees supervisor. Port of Entry clothing requirements are covered in DMV User Manual, Chapter 213 Personal Appearance Standards.

6.3.10.1.3. Definitions:

6.3.10.1.3.1. Summer Safety Footwear: Safety footwear that meets the applicable ASTM as defined below and has a minimum boot height of 5 inches, is over the ankle and has a defined heel.

6.3.10.1.3.1.1 Boot height is measured from inside the shoe from sole to top of the outer upper.

6.3.10.1.3.1.2. Over the ankle means the upper boot covers the knobs on both sides of the ankle when worn. This may be taller than 5 inches for larger boned persons.

6.3.10.1.3.1.3. Defined heel means there is a clear depression or notch at the rear of the sole before the heel begins. The purpose of this notch is to prevent the foot from sliding off the rung of a ladder and out the back of the ladder. Wedge or flat style soles do not meet this criteria.

6.3.10.1.3.2. Winter Safety Footwear: A rubberized or leather insulated boot with a minimum boot height of 5 inches, is over the ankle and has a defined heel. Must be designated as insulated by the manufacturer. A salt- resistant overshoe would also qualify as a winter style if worn with the issued Summer Safety Toe Footwear.

6.3.10.1.3.2.1 Boot height is measured from inside the shoe from sole to top of the outer upper.

6.3.10.1.3.2.2. Over the ankle means the upper boot covers the knobs on both sides of the ankle when worn. This may be taller than 5 inches for larger boned persons.

6.3.10.1.3.2.3. Defined heel means there is a clear depression or notch at the rear of the sole before the heel begins. The purpose of this notch is to prevent the foot from sliding off the rung of a ladder and out the back of the ladder. Wedge or flat style soles do not meet this criteria.

6.3.10.1.3.3. Safety-toe Shoe: Includes Summer Safety Footwear but could also include approved low-quarter tennis/walking style safety toe shoe.

6.3.10.1.3.4. Specialty Safety Footwear: Safety Footwear designated by the manufacture for use in the specialty area required.

6.3.10.1.4. Safety footwear is assumed to have the following service life:

6.3.10.1.4.1. A two (2) year service life for Category 1, 2, 4, 5 summer safety footwear.

6.3.10.1.4.2. A five (5) year service life for Category 3 summer safety footwear and all winter footwear.

6.3.10.1.4.3. Service life is based on footwear being properly cared for and not abused. The District Engineer, Division Administrator, or senior leadership team (SLT) member may authorize more frequent replacement if warranted on a case-by-case basis.

6.3.10.1.4.4. Employees are not to sell or exchange the footwear without authorization from the District Engineer, Division Administrator, or SLT member.

6.3.10.1.4.5. If the footwear is deemed abused or neglected, ITD may request the employee replace at their own expense.

6.3.10.1.5. Price and purchasing criteria is established by Financial Services.

6.3.10.1.6. Specifications: All Safety Toe Footwear must meet the following minimum requirements:

6.3.10.1.6.1. Categories 1, 2, 3, and 5 must meet or exceed the standard ASTM F2413-11, M I/75/C/75/, as modified. Supply, warehouse, and office personnel who work mainly indoors may use safety-toe shoes.

6.3.10.1.6.2. Category 4 Safety Footwear for electricians must meet or exceed the standard ASTM F2413-11, M I/75/C/75/, EH, as modified. Other Category 4 footwear must meet the appropriate specifications for the specific specialty area.

6.3.11. Leg Protection:

6.3.11.1. General: When performing construction, maintenance or industrial work, or when visiting construction, maintenance or industrial areas including in the right of way ITD employees must be suitably attired in long pants made of durable material such as denim or cotton duck. Protective footwear shall be worn whenever there is a reasonable possibility of foot or leg injuries from heavy or sharp objects and electrical shock and/or static electricity. Use appropriate foot guards, safety shoes or boots and leggings for protection of feet and legs from falling or rolling objects, sharp objects, molten metal, hot surfaces and wet slippery surfaces.

6.3.11.2. Welding and Cutting: Leggings or apron shall be worn when welding or cutting to protect the lower leg and feet from molten metal or welding sparks. Safety snaps permit leggings rapid removal if they must be removed quickly. Refer to Chapter 14 Welding, Cutting and Brazing in this safety manual for additional information.

6.3.11.3. Chainsaw Chaps shall be worn when operating gas, electric or battery operated chainsaws. Chaps must also be worn when operating any chainsaw from a bucket truck. Refer to **Chapter 10** of this Employee Safety Manual for further guidance on PPE during chainsaw operations.

Chapter 7 - Incident Reporting and Investigation

7.1. General Requirements

All incidents, regardless of severity, must be reported to the immediate supervisor in a timely manner. This includes damage to state vehicles or equipment, damage to state property or injuries to ITD employees. Timely reporting and investigating of all incidents may help to eliminate the cause, thus saving another worker from making the same error, thus preventing further damage or injury. This procedure is designed to assist The Safety and Risk Management office in implementing the provisions of Idaho Code Section 67-5309(n) and Division of Human Resources Rule 190.01 (IDAPA 15.04.01.190).

7.2. Purpose:

7.2.1. The incident reporting, investigation and prevention process seeks to clearly define the incident investigation process for examining injury, vehicle, and property damage incidents to determine prevention strategies and/or employee discipline, if warranted. This applies to all ITD employees. Its focus is to:

7.2.1.1. Identify and eliminate hazards from the workplace, while allowing employees to perform their assigned functions without fear of unjust reprisal.

7.2.2. Establish the standard of examining incidents for safety improvement opportunities and/or violation of ITD policy or state policy or state law or reckless or at-risk behavior as litmus for entering into the discipline process.

7.2.3. Establish a 24-month window for considering accidents as “repeat offenses” beyond which accident forgiveness will be considered.

7.3. Responsibilities

7.3.1 Reporting Unsafe Conditions and Practices: It is the duty of all employees to report immediately to their supervisor any unsafe conditions related to motor vehicles, equipment, shops, and garages that may jeopardize safety to themselves, other employees, or the general public. It is also the duty of the employee to report to the immediate supervisor any unsafe practices carried on by other employees which jeopardizes that employee, other employees, equipment/property, or the general public. These reports should be in writing and brought to the attention of SCOs or the ESRM.

7.3.2. All employees are required to report incidents and participate in investigating incidents as outlined in this chapter. Initial notifications shall be made by telephone with follow up written reports.

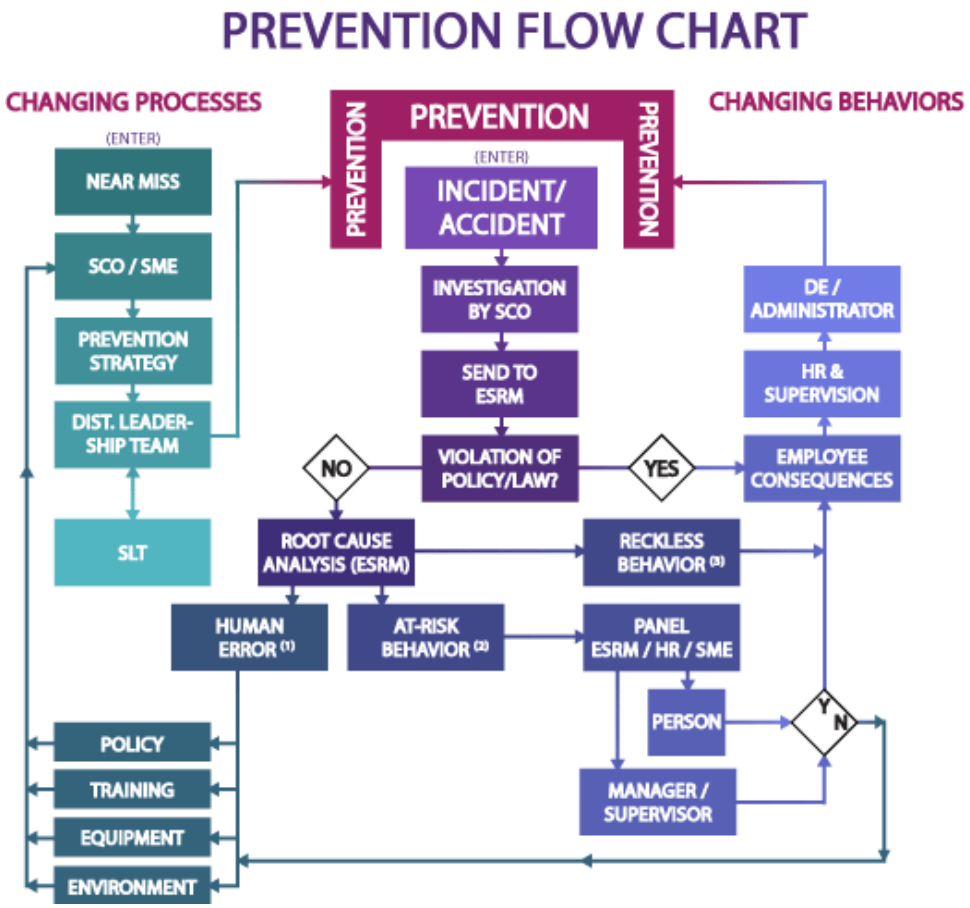
7.3.3. In addition, this chapter defines the review process whereby the Employee Safety and Risk Manager, the HR Supervisor and one SME will review cases where reckless or at-risk behavior may have been causal to the incident. The SME will be selected from a pool of highly experienced employees with expertise in the work being accomplished during the

incident. The SME should be selected from a different District/Division than the employee being considered for discipline. The recommendation of the panel will be provided to the appropriate Supervisor, District Engineer or Administrator. The recommendation will fall into one of three categories:

(1) HUMAN ERROR: An inadvertent slip or lapse. Human error is expected, so systems should be designed to help people do the right thing and avoid doing the wrong thing. Repeating the same error may be considered at-risk behavior.

(2) AT-RISK BEHAVIOR: Consciously choosing an action without realizing the level of risk of an unintended outcome. Repeating the same at-risk behavior may be considered reckless behavior.

(3) RECKLESS BEHAVIOR: Choosing an action with knowledge and conscious disregard of the risk of harm.



7.4. Notifications:

7.4.1. Employees involved in or witness to an incident resulting in death of an employee, major on the job injury to an employee, major equipment damage or property damage or loss shall notify their supervisor by telephone immediately. Minor incidents must be reported to the supervisor within 12-hours.

7.4.2. The supervisor shall notify their supervisor and the SCO or ESRM of any incident resulting in death of an employee, major on the job injury to an employee, major equipment damage or property damage or loss by telephone immediately. This timeline is critical for incidents involving commercial motor vehicles due to Federal Motor Carrier rules for post incident drug testing protocols. Minor incidents must be reported to the SCO or ESRM within 12-hours.

7.4.3. The District Safety Compliance Officer shall notify the District Engineer, Administrative Services Division Administrator, and the Employee Safety/Risk Manager (ESRM) by telephone of any incident resulting in death of an employee or major on the job injury to an employee immediately. Notifications of incidents resulting in major equipment damage or property damage or loss must be made the next business day.

7.4.3.1. For incidents resulting in facilities damage the SCO will notify the District Business Operations Manager (BOM) and Facilities BOM the next business day.

7.4.4. The Employee Safety & Risk Manager shall notify all members of Executive Management and the Department of Administration Office of Risk Management Programs (RMP), and other external agencies as appropriate.

7.4.4.1. For incidents resulting in damage or loss to HQ facilities the ESRM will notify the HQ Facilities Manager the next business day.

7.4.5. The ESRM Manager or SCO shall contact the Division of Administration, Office of Risk Management (RMP) as soon as possible if an incident involves serious injury, death, or appears to be a high dollar claim involving ITD and a public party or construction work zones with ITD oversight. The RMP staff shall make a determination whether to assign an adjustor to go to the scene when possible or to review the damaged equipment and property. The adjustor shall provide an objective investigation report to assist in claim decisions.

7.4.5.1. Employees shall not make any statement as to responsibility to people outside of ITD at the scene of the incident in which they are involved. They will, however, provide necessary information and assist in the completion of incident report forms for law enforcement and as described in the following sections.

7.5. Incident Reporting Procedures.

7.5.1. Reporting of injuries, vehicles damage and property damage have separate and distinct reporting processes and forms as outlined below.

7.5.2. **Personnel Injury:** Injury or near miss incidents to personnel will be reported using the ITD-1207. This form will be completed by the immediate supervisor or supervisor having knowledge of the incident or activity that resulted in the injury. The form must be completed and forwarded to the SCO or ESRM within 24-hours of the incident.

7.5.2.1. The supervisor shall examine the extent of the injury to determine if the employee will seek medical attention. If the employee will seek medical attention the SCO will forward the ITD-1207 to the district HR Associate. The HR Associate will submit a First Report of Injury to State Insurance Fund to open a worker's compensation case.

7.5.3. **Vehicles and Equipment:** Any incident in which a department vehicle is involved resulting in damage to a vehicle or object and/or injury or death to a large animal or person must be reported. A department vehicle is deemed to be any item of road equipment, whether self-propelled, hand-propelled, towed, or mounted. Incidents resulting in damage or near misses to department vehicles will be reported using the ITD-556. This form will be completed by the immediate supervisor or supervisor having knowledge of the incident or activity that resulted in the damage or near miss. The form must be completed and forwarded to the SCO or ESRM within 24-hours of the incident.

7.5.3.1. The SCO will in-turn notify the district fleet manager and Division of Administration Office of Risk Management to begin the claims and or repair process.

7.5.4. **Property Damage, Theft or Loss:** Incidents resulting in damage, theft or loss of ITD facilities or property will be reported using the ITD-2536. This form will be completed by the immediate supervisor or supervisor having knowledge of the incident or activity that resulted in the damage, theft or loss. The form must be completed and forwarded to the SCO or ESRM within 24-hours of the incident.

7.5.4.1. The SCO will in-turn notify the district Facilities BOM and Division of Administration Office of Risk Management to begin the claims and or repair process.

7.5.4.2. Major losses are to be reported by telephone to the Office of Risk Management at (208) 332-1869 and immediately to the Employee Safety & Risk Management Manager. The Equipment or Property Damage/Loss Form, ITD 2536, must be filled out for loss of capital property or equipment valued over $500. This form is sent to the District Engineer for signature, and then submitted to ESRM office, and a copy to the Supply Services Manager if it needs disposed of or removed from the asset inventory.

7.5.4.3. Damage over $2,000 (such as fire damage) to ITD buildings, contents, or non-motorized equipment, that is not being charged to an outside party, will be filed against our insurance policy and must be reported as soon as possible to the Department of Administration, Office of Risk Management.

7.5.4.4. When state property such as roadways, bridges, guardrails, traffic lighting, etc., is damaged by other parties, appropriate action should be taken to collect from the parties

responsible for the damages and the actual cost of repairs. When a third party is responsible, the district Financial BOM will bill the party who may then submit the claim to their insurance company. The Legal Section may be requested to assist with these claims and should be notified of large dollar claims when they occur.

7.5.4.5. The District Operations Engineer is responsible for coordinating repair of the damages and reporting the cost of repairs. A Report of Damage to State Property, ITD 215, is used to document all costs to be billed.

7.5.4.5.1. If there will be a delay in making repairs, the Foreman will advise the District Maintenance Office of the estimated date of repairs and the estimated cost of repairs so the District Maintenance Office can complete an ITD-215 Report of Damage to State Property for processing.

7.5.4.6. Filing and Collecting for Damages:

7.3.3.6.1. The District Engineer, District Operations Engineer and/or District Financial BOM shall attempt to collect the amount it cost ITD to repair or replace the damaged property.

7.5.4.6.2. Large claims such as Bridge and overpass structure damage, submit the original and one copy of the Report of Damage to State Property (ITD 215) and all supporting documentation to the Legal Section. The ITD 215 must accurately state the full name and complete address, including ZIP code, of the party(ies) causing the damage. Whenever police incident reports have been made, they should be attached to our claim form. If a report is not available, it should be so indicated on the ITD 215.

7.5.4.6.3. Damage over $2,000 (such as fire damage) to ITD buildings, yards, or non-motorized equipment, and not being charged to an outside party, will be filed with the Department of Administration, Risk Management office, and must be reported, as soon as possible on the ITD 2536, State of Idaho Property Damage or Loss Reporting Form along with all supporting documentation including original cost and replacement or repair cost.

7.5.4.6.4. Photographs are to be submitted when available. Major losses are to be reported by telephone to the office of Risk Management at (208) 334 -8038.

7.5.4.6.5. Distribution: The State of Idaho Property Damage or Loss Reporting Form ITD 2536, along with a complete narrative explaining the incident, shall be emailed sent to the following:

7.5.4.6.5.1. District Engineer

7.5.4.6.5.2. District Operations Engineer

7.5.4.6.5.3. SCO to process and send to ESRM

7.5.4.6.5.4. Submit all Originals to the ESRM Manager to submit for policy coverage. When appropriate copies will be sent to:

7.5.4.6.5.4.1. Headquarters Maintenance Services [Large Equipment & Building Losses]

7.5.4.6.5.4.2. Financial Services Controller [Large Equipment & Building Losses]

7.5.4.6.5.4.3. Administrative Services Division Administrator for HQ property losses

7.5.4.6.5.4.4. All of the incidents described above should be documented in a diary for future reference.

7.6. Investigation Procedures

7.6.1. **Injury Incidents**: Injury or near miss incidents will be investigated thoroughly to identify workplace hazards, determine root cause(s) and develop prevention strategies.

7.6.1.1. Upon notification of an injury incident involving a subordinate the supervisor will conduct an investigation into the circumstances surrounding the incident and document on the ITD-1207. Send the completed ITD-1207 to the appropriate SCO or the ESRM, if it involves a headquarters or Aeronautics employee within 24-hours.

7.6.1.2. The SCO will complete the investigation to determine the root cause of the incident. In addition, the SCO will make a determination as to whether the incident is Recordable or just Reportable.

7.6.1.3. Recordable: You must consider an injury or illness to meet the general recording criteria, and therefore to be recordable, if it results in any of the following: death, lost work days (LWD), restricted work or transfer to another job, medical treatment greater than first aid (GTFA), or loss of consciousness (LOC). You must also consider a case to meet the general recording criteria if it involves a significant injury or illness diagnosed by a physician or other licensed health care professional, even if it does not result in death, lost work days, restricted work or job transfer, medical greater than first aid, or loss of consciousness. A work-related injury or illness must be recorded if it results in one or more of the following:

7.6.1.3.1. An injury is Recordable if it:

- Causes death, in-patient hospitalization, amputation, or loss of an eye.
- Causes absence from work (LWD), activity restriction on the job, or moving the employee into another job (i.e. modified duty)
- Results in a work-related diagnosed case of cancer, chronic irreversible diseases, fractured or cracked bones or teeth, and punctured eardrums.
- Requires medical treatment greater than first aid (GTFA)

- Causes loss of consciousness (LOC) (no matter how short)
- Results in using a non-prescription medication at prescription strength as recommendation by a physician or other licensed health care professional.
- Results in administering immunizations (other than tetanus) such as Hepatitis B vaccine or rabies vaccine.
- Closing wounds using closing devices such as adhesives, sutures, staples, etc.
- Results in using devices with rigid stays or other systems designed to immobilize parts of the body.
- Results in physical therapy or chiropractic treatment as recommendation by a physician or other licensed health care professional.

7.6.1.3.2. First Aid Defined (Reportable):

- Using a non-prescription medication at non-prescription strength (for medications available in both prescription and non-prescription form, a recommendation by a physician or other licensed health care professional to use a non-prescription medication at prescription strength is considered medical treatment for recordkeeping purposes);
- Administering tetanus immunizations (other immunizations, such as Hepatitis B vaccine or rabies vaccine, are considered medical treatment);
- Cleaning, flushing or soaking wounds on the surface of the skin;
- Using wound coverings such as bandages, Band-Aids™, gauze pads, etc.; or using butterfly bandages or Steri-Strips™ (other wound closing devices such as adhesives, sutures, staples, etc., are considered medical treatment);
- Using hot or cold therapy;
- Using any non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc. (devices with rigid stays or other systems designed to immobilize parts of the body are considered medical treatment for recordkeeping purposes);
- Using temporary immobilization devices while transporting an accident victim (e.g., splints, slings, neck collars, back boards, etc.).
- Drilling of a fingernail or toenail (by a medical professional) to relieve pressure, or draining fluid from a blister;
- Using eye patches;
- Removing foreign bodies from the eye using only irrigation or a cotton swab;
- Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means;
- Using finger guards;
- Using massages (physical therapy or chiropractic treatment are considered medical treatment for recordkeeping purposes);

- Drinking fluids for relief of heat stress.

7.6.1.3.3. The SCO will forward the ITD-1207 any supporting documentation to the ESRM for review within 7 days of the incident. Do not delay preliminary reporting waiting outside reports such as police reports, doctor's note or employee return to work. A final/corrected report can be submitted once outside supporting documentation is received.

7.6.1.3.4. The SCO will also forward a copy of the report to the appropriate supervisor, Operations Engineer and District Engineer. In addition the SCO will include the investigation results in the monthly Incident Reduction Committee. The incident Reduction Committee will review the incident for potential prevention strategies.

7.6.2. **Vehicle Incidents:** Vehicle damage and near miss incidents will be investigated thoroughly to determine root cause(s) and develop prevention strategies.

7.6.2.1 Upon notification of an incident involving a subordinate the supervisor will conduct a preliminary investigation into the circumstances surrounding the incident and document on the ITD-556. Send the completed ITD-556 to the appropriate SCO or the ESRM, if it involves a headquarters or Aeronautics employee within 24-hours.

7.6.2.1.1. If the vehicle repair cost will exceed $1000 forward the incident report to Department of Administration, Office of Risk management for reimbursement. Risk Management may request quotes from multiple repair shops or send a member of their office or an independent appraiser to assess the damage.

7.6.2.2. The SCO will complete the investigation, determined the root cause of the incident forward the ITD-556 and any supporting documentation to the ESRM for review within 7 days of the incident. Do not delay reporting awaiting outside reports such as police reports, damage estimates or claims adjusters report. A final/corrected report can be submitted once outside supporting documentation is received.

7.6.2.3. The SCO will also forward a copy of the report to the appropriate supervisor, Operations Engineer and the Fleet Manager. In addition the SCO will include the investigation results in the monthly Incident Reduction Committee. The incident Reduction Committee will review the incident for potential prevention strategies.

7.6.2.4. If ITD is involved in an incident with a non-ITD-owned vehicle, the SCO will send the original ITD-556 to the Department of Administration Office of Risk Management. If it is determined that the incident was the fault of the other party, the Fleet BOM will coordinate filing of insurance claims for the repair or replacement of ITD equipment.

7.7. Record Keeping Guidelines for Injury and Vehicular Incidents:

An injury or illness is considered work-related if it occurs in the work environment (defined as any area on the employer's premises, e.g., worksite, or company parking lot) and occurred while

performing assigned work duties. The work environment surrounds the workers wherever they are – on official travel, in dispersed operations, or along regular routes.

7.7.1. **Work-Related Minor Injury Incidents:** If the injury only requires first aid or there is no evidence of physical injury and the employee misses no time from work, it is recorded as Reportable and treated as an injury near miss incident that will not be numbered and will not be entered in the database. Keep these reports a minimum of 6 months.

7.7.1.1. If there are later complications that require medical treatment, such as an infection, or lost time from work an incident will then be assigned a number; the report will be entered in the database and a FROI submitted to State Insurance Fund to open a workers compensation case.

7.7.1.2. If an employee goes immediately to a medical treatment facility, including for first aid treatment as previously described, the incident will need to be numbered and a FROI sent to SIF to open a workers compensation case.

7.7.2. **Vehicular Incidents:** Damage to ITD vehicles and other motorized equipment will be recorded as a numbered Vehicular Incident if:

7.7.2.1. Any vehicles or property in a collision requires repair.

7.7.2.2. Private citizens are involved who may open ITD to possible tort claims.

7.7.2.3. Violation of one or more of the basic safety regulations, as listed in the Employee Safety Manual, is obvious.

7.7.3. Minor Incidents: All Vehicular Incidents must be reported, even if the incident seems minor at the time it occurs. Situations where no injury or very little damage occurred and no repairs are needed, but were the result of unsafe practices or unexpected circumstances, should be considered a near miss with no incident number. These near miss incidents will be discussed at Safety Committee meetings for purpose of identifying and eliminating hazards.

7.7.3.1. Minor Incidents may include:

7.7.3.1.1 Opening a vehicular door into an object, denting the door or the object, but with no cost to repair.

7.7.3.1.2. Small animal or bird hits the vehicle, resulting in minor damage to a grill, etc.

7.7.3.1.3. Minor vehicular damage that does not require repairs, with no negligence involved.

7.7.3.1.4. Rocks flipping onto windshield causing star or crack.

7.8. Incident Numbering Procedures:

7.8.1. Districts will number each incident report for recording and identification purposes using the system described below. All headquarters and Aeronautics vehicular incident reports will be numbered by the ESRM.

7.8.2. Each Vehicular Incident number will have the prefix "V" and each work-related Injury incident number will have the prefix "I."

7.8.3. It is intended that each incident has its own numerical sequence – they are not to be mixed together. The numbering is to start over again beginning with each fiscal year. The first two digits will identify the district number, the second and third digits will identify the year, and the fourth and fifth digits will be the numerical number of the incident within the year. The last three digits will represent the area Foreman, supervisor, Division Administrator or Section Manager.

7.8.4. On the First Report of Injury or Illness sent to the SIF, the district number is shown as "Organization Code." All HQ and Aeronautics Division incidents will be numbered as District 09. Incidents are numbered sequentially throughout the fiscal year, starting over each July 1. The following information is contained in an incident number:

7.8.4.1. Incident Type: "I" for Injury and "V" for Vehicular

7.8.4.2. The district number (2 characters)

7.8.4.3. The fiscal year (2 characters)

7.8.4.4. The number for this incident (2 characters)

7.8.4.5. The foreman number (3 characters)

7.8.4.6. Injury Example 1: I – 03 – 96 – 04 – 350

7.8.4.7. Vehicle Example 2: V – 02 – 96 – 07 – 211

7.9. Hazardous Materials Contamination/Environmentally Endangering Incidents:
Hazardous materials (HazMat) contamination or other environmentally endangering incidents shall be reported to HQ Emergency Program Manager and the HQ Environmental Section. The Emergency Program Manager will notify the ESRM if there was an employee injury or potential tort claim against ITD.

7.10. Insurance, Legal and Policy Requirements.

7.10.1 Vehicular Liability Insurance Coverage:

7.10.1.1. The Department of Administration, Office of Risk Management Programs, carries public liability and auto liability damage insurance for ITD to protect employees while they are operating ITD equipment. Idaho is self-insured in the amount of $500,000 for each incident. This is also the maximum exposure of the employee under state law.

7.10.1.2. The policy covers liability on all automobiles, trailers, and self-propelled equipment of ITD during all operations upon the highway and right-of-way, as well as the movements and/or transportation of such equipment over the highways.

7.10.1.3. The policy also carries employer's non-owned auto liability coverage. It extends coverage to leased or rental equipment that is used for official ITD business in the same manner as if it were owned by ITD. The policy further extends coverage to include private automobiles when used on official state business with prior written approval from the Director or the appropriate Division Administrator, Section Manager, or District Engineer. It is further specified that the state's policy is secondary to the coverage provided by the individual's own insurance, which would be the primary insurer.

7.10.1.4. The licensed motorized equipment Auto Physical Damage coverage has a $1,000 deductible. The ITD-556 Vehicular Incident report, along with the police report, documentation of the original cost of the equipment, the repair or replacement estimate and photos of the damage will be submitted for insurance reimbursement on all damage over the $1,000 deductible. Aircraft and state-owned airports are covered under a similar but separate policy.

7.10.2. General Liability Insurance Coverage (Excluding Auto): The Department of Administration, Office of Risk Management and its retained carrier covers comprehensive general liability claims resulting from incidents occurring on the state highway system or other state property. Department of Administration, Office of Risk Management is responsible for the settlement or defense of any claims of this type naming the state or its employee as a defendant.

7.10.2.1. Tort Claims:

7.10.2.1.1. Liability or tort claims may arise as a result of, but not be limited to, improper design or engineering; incidents involving potholes, slick pavements, or rocks on the road; lack of or inadequate signing; spraying operations (paint, chemicals, or asphalt); blasting operations; and the use of equipment not covered by auto liability insurance, such as jackhammers, pavement breakers, backhoes, and motorized equipment that is not licensed for highway use.

7.10.2.1.2. This self-insured protection is $500,000 combined single limit for each occurrence. The Department of Administration Office of Risk Management is responsible for the disposal of all tort claims.

Note

ITD and/or the Department of Administration Office of Risk Management is not responsible for personal items (including tools) lost or stolen from desks, lockers, vehicles, or any other state-owned property.

7.10.2.1.3. Notification:

7.10.2.1.3.1. At times, employees may witness or have factual information about incidents that occur on the state highway system or other state property. It is extremely important that they record and report this information as quickly as possible to their SCO or ESRM.

7.10.2.1.3.2. In the case of an extreme emergency where substantial bodily injury or property damage has occurred, it is to ITD's advantage to have an immediate investigation initiated. Notify the below offices immediately by telephone:

- Dept of Administration Office of Risk Management at (208) 332- 1871
- ITD Employee Safety/Risk Management Manager at (208) 334-8038

7.10.2.1.4. Reporting:

7.10.2.1.4.1. Submit property damage on the Tort Claim Data for Risk Management, ITD 1746, and vehicle damage on the ITD Incident Notice, ITD 556.

7.10.2.1.4.2 Email the form to the District SCO or ESRM. The SCO or ESRM will forward the information to the Department of Administration Office of Risk Management as appropriate.

7.10.2.1. 5. Citizen Filing Procedures: If a citizen wishes to claim ITD was the cause of damage to their property, they should be referred to the Office of Risk Management, Claims Management Web page at:

https://adm.idaho.gov/insurance-and-internal-support/risk-management-program/tort-claim-filing/

7.10.3. Requests for Information by Outside Parties: Public Information Request should be referred to the ITD Homepage at:

www.itd.idaho.gov

7.10.3.1. Consult with the Legal Section before any employee gives information to parties outside ITD or the Department of Administration Office of Risk Management.

7.10.3.2. When any request for information other than written documents covered by the Public Records Act concerning a claim or potential claim is received, please contact the following:

Department of Administration, Risk Management
Telephone (208) 332-1868 or 332-1871
Fax (208) 334-5315

7.10.4. Public Relations and Legal Issues:

7.10.4.1. ITD employees are sometime confronted by citizens who are displeased or angry with ITD activities or incidents. ITD employees shall conduct themselves with courtesy at all times as befits a representative of ITD. There must be no display of temper. Arguments with the public must be avoided, regardless of provocation. Report any such confrontation to your supervisor as soon as practical.

Chapter 8 – Signal and Electrician Safety

8.1. Introduction.

This program establishes minimum standards to prevent hazardous electrical exposures to personnel and ensure compliance with regulatory requirements applicable to electrical systems. Working on equipment in a de-energized state is **required** unless de-energizing introduces an increased hazard or is infeasible. This program is designed to ensure that energized and de-energized electrical work at Idaho Transportation Department facilities is performed safely by licensed electricians who are trained, following appropriate safe work procedures and equipped with protective equipment. The program is intended to protect employees against electrical shock, burns, and other potential electrical safety hazards, as well as comply with regulatory requirements. **All electrical work above 50 volts must be performed by a licensed electrician.**

8.1.1. **Purpose.**

8.1.1.1. This program has been established in order to:

8.1.1.1.1. Ensure the safety of ITD employees who may work on or near electrical equipment.

8.1.1.1.2. Ensure that ITD employees understand and comply with safety standards and practices related to electrical work.

8.1.1.1.3. Comply with the State of Idaho Division of Building Safety, NFPA, NEC, and OSHA Standards, according to the following six points:

8.1.1.1.3.1. Provide and demonstrate a safety program with defined responsibilities.

8.1.1.1.3.2. Determine the degree of arc flash hazard or comply with NFPA 70E.

8.1.1.1.3.3. Affix warning labels on equipment.

8.1.1.1.3.4. Provide personal protective equipment (PPE) for workers.

8.1.1.1.3.5. Provide documented training to workers on Lockout/Tag-out procedures and the hazards of arc flash.

8.1.1.1.3.6. Provide appropriate tools for safe electrical work.

8.1.2. **Scope.** This program applies to all Idaho Transportation Department properties and work performed by its employees regardless of job site location. External contractors will also comply with all State of Idaho Division of Building Safety, NFPA, NEC, and OSHA Standards when performing work on facilities.

8.2. Responsibilities.

ITD will determine electrician assignment and responsibilities based on staff expertise, resources, and district specific considerations. The safety of our employee is always the first priority. ITD employees will follow all safety procedures. Where electrical hazards exist, safe

electrical protocols shall be followed to ensure that work is accomplished in the safest work environment possible.

8.2.1. **District Safety Compliance Officer**.

8.2.1.1. Periodically determine compliance with this program.

8.2.1.2. Review training recordkeeping as required.

8.2.1.3. Periodically review and update this written program.

8.2.1.4. Evaluate the overall effectiveness of the electrical safety program on a periodic basis.

8.2.1.5. Maintain JSA's for lockout/tag-out procedures for all machines and equipment in district.

8.2.2. **Electricians**.

8.2.2.1. Promote electrical safety awareness to all ITD employees.

8.2.2.2. Ensure all electrical work and repairs are performed in compliance with current electrical code.

8.2.2.3. Assist District with implementation of electrical safety program and coordinate efforts for uniformity of compliance throughout the department.

8.2.2.4. Evaluate work being performed.

8.2.2.5. Ensure employees receive training appropriate to their assigned electrical tasks.

8.2.2.6. Ensure ongoing annual required electrical credits/training is completed and reported as needed.

8.2.2.7. Place an emphasis on controlling electrical hazards through the application of engineering and design controls.

8.2.2.8. Ensure that all applicable work is permitted and inspected by the State of Idaho, DBS as per Idaho Code.

8.2.2.9. Complete arc flash analyses when required by this program or NFPA-70E.

8.2.2.10. Immediately report any concerns related to electrical safety to supervision

8.3. Electric Hazards.

8.3.1. Electricity-related hazards include electric shock and burns, arc-flash burns, arc-blast impacts, and falls. These hazards are defined as:

8.3.1.1. Electric shock and burns. An electric shock occurs when electric current passes through the body. This can happen when touching an energized part. If the electric current passes across the chest or head, death can result. Severe burns can also result from contact with energized electrical equipment.

8.3.1.2. Arc-flash burns. An electric arc flash can occur if a conductive object gets too close to a high-amp current source or by equipment failure (for instance, while opening or closing disconnects). The arc can heat the air to temperatures as high as 35,000º F, and vaporize metal in the equipment. The arc flash can cause severe skin burns by direct heat exposure and by igniting clothing.

8.3.1.3. Arc-blast impacts. The heating of air and vaporization of metal creates a pressure wave that can cause internal and external bodily injury, including hearing loss, brain injury, cuts, bruises, and burns.

8.3.1.4. Falls. Electric shocks and arc blasts can cause falls, especially from ladders or unguarded scaffolding.

8.4. Safe Electrical Procedures—Energized Condition.

8.4.1. De-energize whenever possible.

8.4.2. Plan Every Job. The approach and step-by-step procedures to complete the work at hand must be discussed and agreed upon between all involved employees before beginning. The following steps will help determine the development of a proper and safe work site.

8.4.2.1. Write down first-time procedures. Fill out an ITD-2842 Job Safety Analysis form if one does not exist for the special work function.

8.4.2.2. Discuss hazards and procedures in a job, briefing with a supervisor and other workers before starting any job.

8.4.2.2.1. It is the employer's responsibility to develop a checklist system for working on live circuits.

8.4.3. Identify the Hazards. Conduct a job hazard analysis. Identify steps that could create electric shock or arc-flash hazards. Consult existing JSA's.

8.4.4. Minimize the Hazards.

8.4.4.1. De-energize and LOTO equipment.

8.4.4.2. Insulate or isolate exposed live parts so contact cannot be made.

8.4.4.3. Obtain and wear proper personal protective equipment (PPE) and tools.

8.4.5. Anticipate Problems. If something can go wrong, plan out the responses and equipment needed for proper action. Make sure the proper PPE and tools are immediately available for worst-case scenarios.

8.4.6. Obtain Training. Make sure all involved ITD employees are qualified and have had appropriate training for the job.

8.5. Lockout/Tag-out Procedures.
Only licensed electricians may develop and implement electrical lockout/tag-out procedures. Refer to **Chapter 13** for the LOTO written program, documentation, and training requirements.

8.6. Working on or Near Energized Equipment.

8.6.1. Working near live circuits means working close enough to energized parts to pose a risk even though work is on de-energized parts. Common tasks where there may be a need to work on or near live circuits include, but are not limited to:

8.6.1.1. Taking voltage and amperage measurements.

8.6.1.2. Opening and closing disconnects and breakers.

8.6.1.3. Racking breakers on and off the bus.

8.6.1.4. Removing panels and dead fronts.

8.6.1.5. Opening electric equipment doors for inspection.

8.6.2. **Electrical Work for 240 Volts and Higher**.

8.6.2.1. Most electrical circuits have been redesigned and are 240 volts or less. If work needs to be performed on a circuit exceeding 240 volts, either the circuit must be de-energized or work should be contracted. If live parts are not placed in an electrically safe condition, work to be performed over 240 volts shall be considered energized electrical work, and shall be performed by a contracted (non-ITD) electrician.

8.6.2.2. **Note:** (FPN) Work related to testing, troubleshooting, and voltage measuring may be completed as long as appropriate safe work practices and PPE are used.

8.7. Working on De-energized Equipment.

8.7.1. Electrically Safe Condition. The most important principle of electrical safety is to assume all electric circuits are energized unless each involved worker ensures they are not**.** Every circuit and conductor must be tested every time work is done on them. Proper PPE must be worn until the equipment is proven to be de-energized.

8.7.1.1. Voltage rated gloves and leather protectors must be worn.

8.7.1.2. Electrically insulated shoes must be worn.

8.7.1.3. Approved insulating mats.

8.7.1.4. Safety glasses must be worn.

8.7.1.4. Fire Resistant (FR) clothing must be worn.

8.7.1.5. Arc Flash PPE must also be worn as required.

8.7.2. The National Fire Protection Association (NFPA) lists six steps to ensure conditions for electrically safe work:

8.7.2.1. Identify all sources of power to the equipment. Check applicable up-to-date drawings, diagrams, and identification tags.

8.7.2.2. Remove the load current, then open the disconnecting devices for each power source.

8.7.2.3. Where possible, visually verify that blades of disconnecting devices are fully open or that drawout-type circuit breakers are fully withdrawn.

8.7.2.4. Apply lockout/tag-out devices in accordance with Chapter 13 of this manual.

8.7.2.5. Test each phase conductor or circuit part with an adequately rated voltage detector to verify that the equipment is de-energized. Test each phase conductor or circuit part both phase-to-phase and phase-to-ground. Check the voltage detector before and after each test to be sure it is working.

8.7.2.6. Properly ground all possible sources of induced voltage and stored electric energy (such as capacitors) before touching. If conductors or circuit parts that are being de-energized can contact other exposed conductors or circuit parts, apply ground-connecting devices rated for the available fault current.

8.7.3. The process of de-energizing is "live" work and can result in an arc flash due to equipment failure. When de-energizing, follow the procedures described in "Working on or Near Live Equipment."

8.8. Personal Protective Equipment (PPE).

8.8.1. **General Requirements.** Employees working in areas where there are potential electrical hazards must be provided with, and use, personal protective equipment (PPE) that is appropriate for the specific work to be performed. The electrical tools and protective equipment must be specifically approved, rated, and tested for the levels of voltage in which an employee may be exposed. ITD shall provide electrical protective equipment as required by the National Fire Protection Association, publication 70E*: Standard for Electrical Safety in the Workplace*.

8.8.1.1. While performing electrical work, all ITD electricians shall be issued and wear Arc Rated/Flame Resistant (AR/FR) apparel meeting a minimum of NFPA Category 1 with an Arc Thermal Performance Rating of 4.0 Cal.

8.8.1.2. ITD Electricians will also be issued eye protection, head protection, hand protection, insulated footwear, and face shields when necessary. See Chapter 6 of this manual for further information on eye, hand, and head protection.

8.8.2. **Arc Rated/Flame Resistant Clothing**.

8.8.2.1. AR/FR Clothing shall be visually inspected before each use. AR/FR clothing that is contaminated with grease, oil, flammable liquids, or combustible liquids shall not be used. AR/FR clothing that is damaged, has holes, or has frayed sections shall not be used.

8.8.2.2. Follow the garment manufacturer's instructions for care and maintenance of AR/FR clothing. When AR/FR clothing has exceeded its maximum wash limits, it shall not be used for electrical work but can still be worn for non-electrical tasks. This practice is highly encouraged as it protects/preserves AR/FR clothing from premature wear-out.

8.8.2.3. When the AR/FR clothing is worn for electrical work, it shall cover all ignitable clothing and allow for movement and visibility. AR/FR clothing must cover potentially exposed areas as completely as possible. Shirt sleeves must be rolled down and fastened, and shirts/jackets must be closed at the neck.

8.8.2.3.1. Non-melting, flammable garments (i.e. cotton, wool, rayon, silk, or blends of these materials) may be used as underlayers beneath FR apparel.

8.8.2.3.2. Fibers that can melt such as acetate, nylon, polyester, polypropylene, and spandex shall not be permitted in fabric underlayers next to skin (an incidental amount of elastic used on non-melting fabric underwear or socks shall be permitted).

8.8.2.4. AR/FR garments worn as outer layers over AR/FR apparel (i.e. jackets or rainwear) must also be made from AR/FR material.

8.8.3. Rubber Insulating Equipment includes protective devices such as gloves, sleeves, blankets, and matting. Insulating equipment must be inspected for damage before each day's use and immediately following any incident that could have caused damage. Insulating equipment found to have defects that might affect its insulating properties must be removed from service until testing indicates that it is acceptable for continued use. Rubber insulating equipment must be tested according to the schedule supplied by the manufacturer.

8.8.3.1. No repairs to rubber insulating equipment shall be attempted without the approval of the manufacturer. An air test must be performed on rubber insulating gloves before each use.

8.8.3.2. Where the insulating capability of protective equipment is subject to damage during use, the insulating material shall be protected by an outer covering of leather or other appropriate materials.

8.9. Insulated Tools and Materials.

8.9.1. Only insulated tools and equipment shall be used within the Limited Approach Boundary of exposed energized parts. Insulated tools shall be rated for the voltages on which they are used. Insulated tools shall be designed and constructed for the environment to which they are exposed and the manner in which they are used.

8.9.2. Fuse or fuse holder handling equipment, insulated for the circuit voltage, shall be used to removed or install a fuse if the fuse terminals are energized.

8.9.3. Ropes and hand-lines used near exposed energized parts shall be nonconductive.

8.9.4. Portable ladders used for electrical work shall have nonconductive side rails.

8.10. Access Limiting Equipment.
Barricades shall be used in conjunction with safety signs to prevent or limit access to work areas containing live parts. Conductive barricades shall not be used where they might cause an electrical hazard. Barricades shall be placed no closer than the Limited Approach Boundary.

8.11. Clear Spaces.
Working space required by the 70E standard shall not be used for storage. When normally enclosed, live parts operating at 50 volts or more are exposed for inspection or service. The working space, if in a passageway or general open space, shall be suitably guarded.

8.11.1. Access and Entrance to Working Space.

8.11.1.1. Minimum required: At least one entrance of sufficient area shall be provided to give access to the working space about electric equipment.

8.12. Contractor Activities.
8.12.1. Contractors are required to comply with applicable OSHA, NFPA, and EPA standards. Contractors may be required to submit copies of their safety program to the safety coordinator upon request.

Chapter 9 – Facilities

NOTE

Compliance with this safety manual is mandatory for all ITD employees. The practices outlined in this manual are designed to keep ITD employees safe from injury while on the job. This content, procedures and best practices are gleaned from various industry standards. In the interest of keeping this manual short, some guidance and procedures are referenced to other outside sources including OSHA standards. This does not indicate that ITD follows OSHA in all instances, or that OSHA standards apply to the State of Idaho. Rather the references in this manual to some OSHA standards is merely an acknowledgment that in certain specific instances OSHA has identified and articulated the best guidance available as a best practice.

9.1. Housekeeping.

9.1.1. Good housekeeping in facilities is important for the safety, efficiency, aesthetics, and morale for all department employees. Supervisors and workers are responsible for good housekeeping in or around the work area they are supervising or working.

9.1.2. Floors and stairs will be kept clean of any foreign substance.

9.1.3. Clean up spills as soon as possible and post warnings until cleanup is complete.

9.1.4. Doorways and aisles will be kept uncluttered and free of obstructions to maintain safe passageway.

9.1.5. Flammable materials shall be stored in approved containers in approved areas. Refer to **Chapter 9.2.5.,** *Flammables Storage,* for additional information.

9.1.6. Materials/items will be stored in proper locations.

9.1.7. Washrooms/bathrooms will be cleaned routinely.

9.1.8. Lights will be maintained in working condition.

9.1.9. Garbage/waste material will be disposed of in a timely manner (daily/weekly).

9.1.10**.** Drawers and cupboard doors will be kept shut when not in use.

9.1.11. Eyewash stations will be checked monthly.

9.1.12. Windows and skylights will be kept clean and in good repair (no materials shall be stacked against windows).

9.1.13. Benches, machines, and part washers shall be kept free of accumulating trash and tools.

9.1.14. Guards and safety devices shall be kept on tools and machines at all times.

9.1.15. Bench grinder shall be kept in adjustment (maximum 1/8 inch from face of wheel to face of rest) at all times.

9.1.16. When grinding aluminum, a grinding wheel designed for aluminum must be mounted on the grinding wheel and used. [Reference IGSH 250.21 Abrasive Wheel Machinery]

9.1.17. Hand tools, jacks, carts, creepers, drop cords, etc., shall not be left lying around on floor areas–everything shall be returned to its proper place.

9.1.18. Floor shall be cleared of any projections such as nails, bolts, and cleats that may be protruding.

9.1.19. Floor opening shall be guarded by railings or barricades at exposed edges.

9.1.20. Loft openings shall be guarded with a chain across opening with accompanying signage.

9.1.21. Floors in carpenter and woodworking shops shall be kept free of dust, shavings, and small pieces of wood.

9.1.22. Floors in machine shops, repair garages, and maintenance stations shall be kept free of oil and grease.

9.1.23. An approved chemical powder or granular cleaner shall be used to clean floors rather than flammable liquids. Floors shall be thoroughly cleaned routinely.

9.1.24. Patches and repairs to concrete, metal, or wooden flooring shall be made flush with the existing floor surface.

9.1.25. Stairways should never be located in dark places unless adequate artificial lighting is made available.

9.1.26. All stairs, landings, treads, and stringers shall be of sufficient strength to handle at least (100 pounds per square foot) live load.

9.1.27. Adequate hand rails shall be provided on stairs.

9.1.28. Stairways will be kept clear of all materials. Where it is necessary and advisable, stairways will be equipped with nonskid treads.

9.2. Fire Prevention.

9.2.1. **General Requirements.** The maintenance and operation of portable fire extinguishers and fire suppression systems may involve exposure to toxic fire extinguishing agents and by-products of combustion. Breathing toxic gases, absorption through skin contact or ingestion of toxic liquids is hazardous to your health. The severity of the hazard depends upon the type of chemical, concentration and duration of exposure. Additionally, fires produce toxic by-products of combustion, consume oxygen and produce high temperatures which create areas immediately dangerous to life and health (IDLH). It is important personnel receive training in the proper use of available portable fire extinguishers and fixed fire suppression systems, and

fire education safety on preventing fires, protecting themselves and intervening early when fire occurs.

9.2.1.1. Make sure the facility is in a fire-safe condition at the close of business.

9.2.1.2. Maintain occupant load information. Every room constituting an assembly occupancy and not having fixed seats shall have the occupant load of the room posted in a conspicuous location near the main exit from the room. The maximum occupant load shall be calculated by the local Fire Department, based on the actual exiting capacity of the corridors, aisles, stairs, doors, and other egress components.

9.2.2. **Exit Signs**.

9.2.2.1. Refer to 29 CFR 1910, Subpart E, *Means of Egress*, and NFPA 101, for additional guidance and information.

9.2.2.2. Fire exits shall be clearly marked and exit paths shall be kept clear of equipment and materials. Emergency lighting shall be provided and all workers trained in proper evacuation procedures.

9.2.2.3. Doors, passageways or stairways which are neither exits nor ways to an exit but may be mistaken for an exit, shall be clearly marked ―NOT AN EXIT‖ or a sign indicating their actual use; for example, ―STORAGE ROOM‖ or ―BASEMENT.‖

9.2.2.4. Nothing shall impair the visibility of the exit sign.

9.2.2.5. No lock or fastening device shall prevent escape from inside the building.

9.2.2.6. Areas around exit doors and passageways shall be free of obstructions. The exit route shall lead to a public way.

9.2.2.7. Floors or means of egress shall be illuminated to at least one (1) foot-candle (measured at all points at the floor), including angles and intersections of corridors and passageways, stairways, landings of stairs and exit doors.

9.2.3. **Extinguishers**.

9.2.3.1. Fire extinguishers need not be visible from all locations within a facility. Workplace safety training provided to each employee by the supervisor shall include the location and use of fire extinguishers.

9.2.3.2. Worker Responsibilities. All employees are responsible for fire extinguishers in their work areas. They shall ensure fire extinguishers are readily accessible with unobstructed access and are used only for the intended purpose.

9.2.3.3. Mount fire extinguishers in or on vehicles or equipment in approved/listed brackets, or otherwise secure them to prevent movement or damage.

9.2.3.4. Visual Inspection. Managers and supervisors at all levels shall ensure a visual inspection is performed at a minimum of 30-day intervals and documented for all fire extinguishers under their control. Extinguishers with discrepancies shall be removed from service until repaired. This inspection includes:

9.2.3.4.1. Extinguisher located in a designated place

9.2.3.4.2. No obstruction to access or visibility

9.2.3.4.3. Operating instructions on name plate legible and facing outward

9.2.3.4.4. Safety seals and/or tamper indicators not broken or missing

9.2.3.4.5. No obvious physical damage, corrosion, leakage or clogged nozzle

9.2.3.4.6. Pressure gauge reading or indicator in the operable range or position

9.2.3.4.7. Fullness determined by weighing or "hefting."

9.2.4. **Maintenance and Tests.**

9.2.4.1. All fire extinguishers shall be maintained and tested at intervals specified in NFPA 10, *Standard for Portable Fire Extinguisher* or the manufacturer's instructions.

9.2.4.2. Ensure all personnel know where fire extinguishers are located and what to do in case of fire. Supervisors shall instruct personnel on fire extinguisher operation upon initial arrival and annually thereafter. **Note:** Personnel assigned for short periods (less than 30 days), However, personnel shall be oriented to the locations of fire apparatus (extinguishers, hoses, alarm boxes, etc.) within their immediate temporary duty area.

9.2.5. **Flammable Storage.**

9.2.5.1. Defining Flammables. To understand the OSHA requirements for the safe storage of flammables, we must first define flammable. The flashpoint and boiling point determine the category of a flammable liquid. Flashpoint is the minimum temperature at which a liquid gives off enough vapor to form an ignitable mixture with air near the surface of the liquid.

9.2.5.2. A flammable liquid is any liquid having a flashpoint at or below 199.4°F (93 °C). Flammable liquids are divided into four categories:

9.2.5.2.1. **Category 1:** Liquids with flashpoints below 73.4°F (23°C) and boiling points at or below 95°F (35°C) (1910.106(a)(19)(i)). Examples: acetaldehyde and ethyl ether.

9.2.5.2.2. **Category 2:** Liquids with flashpoints below 73.4°F (23°C) and boiling points at or above 95°F (35°C) (1910.106(a)(19)(ii)). Examples: acetone, benzene and toluene.

9.2.5.2.3. **Category 3:** Liquids with flashpoints at or above 73.4°F (23°C) and at or below 140°F (60°C). When a Category 3 liquid with a flashpoint at or above 100°F (37.8°C) is heated for use to within 30°F (16.7°C) of its flashpoint, it must be handled in accordance with the requirements for a Category 3 liquid with a flashpoint below 100°F (37.8 °C) (1910.106(a)(19)(iii)).

9.2.5.2.4. **Category 4:** Liquids having flashpoints above 140°F (60°C) and at or below 199.4°F (93°C). When a Category 4 flammable liquid is heated for use to within 30°F (16.7°C) of its flashpoint, it must be handled in accordance with the requirements for a Category 3 liquid with a flashpoint at or above 100°F (37.8°C) (1910.106(a)(19)(iv)). When a liquid with a flashpoint greater than 199.4 °F (93 °C) is heated for use to within 30 °F (16.7 °C) of its flashpoint, it must be handled in accordance with the requirements for a Category 4 flammable liquid (1910.106(a)(19)(v)).

9.2.5.3. Whether liquids are Category 1 or 4 is not the only factor you should consider when determining safe storage needs. You also need to consider ignition temperature, lower and upper explosive limits (LEL or UEL), vapor pressure, specific gravity and vapor density when designing a storage system.

9.2.5.4. Flammable Safety Cans. One tool to help reduce the hazards associated with flammables is the use of safety cans. OSHA defines a safety can as "an approved container, of not more than 5-gallons capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure" (1910.106(a)(29)). This definition allows a wide variety of containers to be considered safety cans. However, many local laws and insurance carriers require safety cans to be Factory Mutual (FM) or Underwriter Laboratory (UL) approved. These two organizations are nationally recognized, independent testing laboratories to which manufacturers submit products for evaluation of their ability to meet safety requirements under intended use. Products that meet the requirements are given either a UL or FM approval. Both laboratories are also recognized by OSHA.

9.2.5.4.1. In addition, 1910.106 Table H-12 limits the maximum size of containers and portable tanks for flammable liquids. The following chart shows the allowable amounts for each category of liquid.

Figure 9.1.

Container Type	Category 1	Category 2	Category 3	Category 4
Glass or approved plastic	1 pint	1 quart	1 gallon	1 gallon
Metal (other than DOT drums)	1 gallon	5 gallons	5 gallons	5 gallons
Safety Cans	2 gallons	5 gallons	5 gallons	5 gallons
Metal Drum (DOT specifications)	60 gallons	60 gallons	60 gallons	60 gallons
Approved portable tank	660 gallons	660 gallons	660 gallons	660 gallons

9.2.5.5. Safety Cabinets**.** Another fundamental means of fire protection is the use of flammable storage cabinets. The NFPA and OSHA require flammable cabinets to be designed and constructed to specific requirements. Per 1910.106(d)(3)(ii), storage cabinets must be designed and constructed to limit the internal temperature to not more than 325°F when subjected to a 10-minute fire test and the cabinets must be labeled in conspicuous lettering, "Flammable - Keep Fire Away." 1910.106(d)(3)(ii)(a) states that metal cabinets must be constructed in the following manner:

9.2.5.5.1. Bottom, top and sides of cabinet must be at least No. 18-gauge sheet iron.

9.2.5.5.2. Cabinet must be double walled with one and one-half inch airspace.

9.2.5.5.3. Joints must be riveted, welded or made tight by some equally effective means.

9.2.5.5.4. Door must have a three-point latch.

9.2.5.5.5. Door sill must be raised at least two inches above the cabinet bottom to retain spilled liquid within the cabinet.

9.2.5.5.6. 29CFR1910.106(e)(2)(ii)[b] limits the quantity of liquids that may be kept outside of an inside storage room or storage cabinet in a building or in any one fire area of a building. These limits are only applicable to those portions of an industrial plant where the use and handling of flammables is only incidental to the principal business. The quantity of liquid that may be stored outside of an inside storage room or storage cabinet in a building or in any one fire area of a building cannot exceed:

9.2.5.5.6.1. 25 gallons of Category 1 liquids in containers

9.2.5.5.6.2. 120 gallons of Category 2, 3 or 4 liquids in containers

9.2.5.5.6.3. 660 gallons of Category 2, 3 or 4 liquids in a single portable tank

9.2.5.5.7. The amount of flammable liquid storage and location of cabinets are also regulated. 29CFR1910.106 (d)(3)(i) states, "Not more than 60 gallons of Category 1, 2 or 3 flammable liquids, nor more than 120 gallons of Category 4 flammable liquids may be stored in a storage cabinet."

9.2.5.5.8. Whenever handling flammable liquids always think of these eight basic tips:

9.2.5.5.8.1. Know your chemical—consult the safety data sheets (SDSs).

9.2.5.5.8.2. Remember, it’s not the liquid itself that burns, but rather, the invisible vapor.

9.2.5.5.8.3. Maintain adequate ventilation, avoid confined areas where vapors can accumulate.

9.2.5.5.8.4. Eliminate potential ignition sources.

9.2.5.5.8.5. Think “covered” or “closed” for containers.

9.2.5.5.8.6. Properly bond and ground containers when transferring.

9.2.5.5.8.7. Keep liquids segregated by type and store according to governing codes.

9.2.5.5.8.8. Use approved storage, transfer, use and disposal equipment, i.e., FM or UL listed.

9.2.6. **Compressed Gasses.**

9.2.6.1. **General Industry Requirements.**

9.2.6.1.1. The storage, handling, use, and inspection of compressed gas must follow the Compressed Gas Association (CGA) guidelines referenced. Supervisors are responsible for safe use of compressed gas cylinders and liquid containers and their contents. Compressed-gas hazards include oxygen displacement, explosion, and toxic effects as well as the physical hazards of a ruptured cylinder. Employers must evaluate

compressed-gas hazards and have an emergency-response plan that defines procedures and responsibilities to address emergencies.

9.2.6.2. **Regulations Applicable to Compressed Gas Containers.**

9.2.6.2.1. **Compressed Gases:** *Compressed Gas Association Pamphlet P-1-1965*, covers in-plant handling, storage, and use of all compressed gas cylinders, portable tanks, or motor vehicle cargo.

9.2.6.2.2. **Inspection of Compressed Gas Cylinders:** Each employer must determine that compressed gas cylinders under his/her control are in a safe working condition to the extent that can be determined by a visual inspection. Visual and other inspections must be conducted as prescribed in the *Hazardous Materials Regulations of the Department of Transportation (49 CFR parts 171-179 and 14 CFR part 103).*

9.2.6.2.3. **Safety Relief Devices for Compressed Gas Containers:** Compressed gas cylinders, portable tanks, and cargo tanks shall have pressure relief devices installed and maintained in accordance *with Compressed Gas Association Pamphlets (CGA) S-1.1-1963 and 1965 addenda and S-1.2-1963.*

9.2.6.2.4. **Welding and Cutting:** The storage, handling, and use of compressed gas containers for welding and cutting shall comply with the *American National Standards Institute ANSI Z-49.1* and *29 CFR 1910.252*.

9.2.6.2.5. **National Fire Prevention Association:** NFPA 55, Standard for the Storage, Use, and

Handling of Compressed and Liquefied Gases in Portable Cylinders. Where those regulations are not applicable, visual and other inspections shall be conducted in accordance with Compressed Gas Association Pamphlets C-6-1968 and C-8-1962.

9.2.6.3. **Handling and Use.** Compressed gases must be handled and used only by trained employees. Employers must inform employees about chemical hazards through a hazard communication program, labels, and other forms of warnings.

9.2.6.3.1. Before cylinders are first used the following precautions should be taken:

9.2.6.3.1.1. Make sure the cylinder is equipped with the correct regulator.

9.2.6.3.1.2. Inspect the regulator and cylinder valves for grease, oil, dirt, and solvent. Never use grease or oil to lubricate regulators or cylinder valves because they can cause an explosion.

9.2.6.3.1.3. The cylinder should be placed so that the valve handle at the top is easily accessible.

9.2.6.3.1.4. When using toxic or irritating gas, the valve should only be opened while the cylinder is in a working fume hood.

9.2.6.3.1.5. Only use wrenches or tools that are provided by the cylinder supplier to open or close a valve. Pliers should never be used to open a cylinder valve. Some regulators require washers; this should be checked before the regulator is fitted.

9.2.6.3.1.6. Refer to SDS for the gas being used for information regarding use and toxicity.

9.2.6.3.1.7. Fire extinguishing equipment should be readily available when combustible materials can be exposed to welding or cutting operations using compressed cylinder gases.

9.2.6.3.2. **Cylinder Storage.**

9.2.6.3.2.1. Gas cylinders must be secured at all times to prevent tipping.

9.2.6.3.2.2. Use appropriate material, such as chain, plastic coated wire cable, commercial straps, etc., to secure cylinders.

9.2.6.3.2.3. Gas cylinders cannot be stored in public hallways or other unprotected areas.

9.2.6.3.2.4. Cylinders must be segregated in hazard classes while in storage. Oxidizers (oxygen) must be separated from flammable gases, and empty cylinders must be isolated from filled cylinders.

9.2.6.3.2.5. The proper storage for oxygen cylinders requires that a minimum of 20 feet is maintained between flammable gas cylinders and oxygen cylinders or the storage area be separated, at a minimum, by a firewall five (5) feet high with a fire rating of 30 minutes.

9.2.6.3.2.6. Store out of direct sunlight and away from sources of heat and ignition; temperatures must not exceed 125 F.

9.2.6.3.2.7. Acetylene cylinders must never be stored on their sides.

9.2.6.3.2.8. Always place valve protectors on gas cylinders when the cylinders are not connected for use.

9.2.6.3.2.9. Cylinders must be protected from damage. Do not store cylinders near elevators or gangways, or in locations where heavy-moving objects may strike or fall on them.

9.2.6.3.2.10. Cylinders must be stored where they are protected from the ground to prevent rusting.

9.2.6.3.2.11. Cylinders should be protected against tampering by unauthorized individuals.

9.2.6.3.2.12. Storage areas must be well-ventilated, cool, dry, and free from corrosive materials.

9.2.6.3.3. **Moving Cylinders.**

9.2.6.3.3.1. Never drag, slide or roll a cylinder; use a cylinder cart or basket.

9.2.6.3.3.2. Always have the protective cap covering the valve when transporting the cylinder unless the valve has built in protection.

9.2.6.3.3.3. Never transport the cylinder with the regulator in place.

9.2.6.3.3.4. Make sure the cylinder is secured to the cart before moving it.

9.2.6.3.3.5. Do not drop cylinders or strike them against each other or against other surfaces violently.

9.2.6.3.3.6. Do not use the valve cover to lift cylinders; they could be damaged and become unattached. If the cylinder is dropped on a hard surface it can cause an explosion.

9.2.6.3.4. **Use and Operation.**

9.2.6.3.4.1. Only properly trained personal should handle compressed gas cylinders.

9.2.6.3.4.2. Back off the pressure adjusting screw of the regulator to release spring force before opening the cylinder valve.

9.2.6.3.4.3. Open the valve slowly and only with the proper regulator in place. Stand with the cylinder between yourself and the regulator (cylinder valve outlet facing away) when opening the cylinder valve. Acetylene or other flammable gas cylinder valves should not be opened more than ½ turns of the spindle, and preferably no more than ¾ of a turn. This reduces the risk of explosion and allows for the cylinder valve to be closed quickly to cut off the gas flow.

9.2.6.3.4.4. Never heat a cylinder to raise the pressure of the gas (this can defeat the safety mechanisms built in by the supplier).

9.2.6.3.4.5. Keep the cylinder clear of all electrical circuits, flame, and sparks.

9.2.6.3.4.6. Never leave the valve open when equipment is not in use, even when empty; air and moisture may diffuse through an open valve, causing contamination and corrosion within the cylinder.

9.2.6.3.4.7. Do not refill a cylinder, mixing of residual gases in a confined area may cause a dangerous reaction.

9.2.6.3.4.8. Never use copper fittings or tubing on acetylene tanks – an explosion may result.

9.2.6.3.4.9. Never use compressed gas to dust off clothing, this could cause injury to the eyes or body and create a fire hazard. Clothing can become saturated and burst into flames if touched off by an ignition source such as a spark or cigarette.

9.2.6.3.4.10. Never leave pressure in a regulator when it is not in use.

9.2.6.3.4.11. Valve protection caps should remain in place until ready to withdraw gas, or connect to a manifold.

9.2.6.3.4.12. Cylinder discharge lines should be equipped with approved check valves to prevent inadvertent contamination of cylinders connected to a closed system.

9.2.6.3.4.13. Do not force connections that do not fit.

9.2.6.3.4.14. Close the cylinder valve and release all pressure before removing the regulator from the cylinder.

9.2.6.3.4.15. Do not smoke when oxygen or fuel gases are present. Smoking can cause a fire or explosion.

9.2.6.3.4.16. Do not use acetylene at operating pressures above 15 psig.

9.2.6.3.4.17. Purge fuel and oxygen hoses individually before lighting up a torch tip.

9.2.6.3.4.18. Follow the equipment manufacturer's operating instructions at all times.

9.2.6.3.4.19. If an outlet valve becomes clogged with ice, thaw it with warm water (if the gas is not water reactive), applied only to the valve.

9.2.6.3.4.20. Use the cylinder valve for turning gas off, not the regulator.

9.2.6.3.4.21. Workers should wear safety glasses and face shields when handling and using compressed gases, especially when connecting and disconnecting regulators and lines.

9.2.6.3.5. **Cylinder Leaks**.

9.2.6.3.5.1. If the cylinder contains a **flammable, inert, or oxidizing gas**, remove it to an isolated area, away from possible ignition sources. Allow it to remain isolated until the gas has discharged, making certain that appropriate warnings have been posted.

9.2.6.3.5.2. If the gas is a **corrosive**, remove cylinder to an isolated, well-ventilated area. The stream of leaking gas should be directed into an appropriate neutralizing material.

9.2.6.3.5.3. For **toxic** material, the cylinder should be removed to an isolated, well-ventilated area, but only if this is possible while maintaining personal safety. It may be necessary to evacuate the facility.

9.2.6.3.5.4. If the leak is at the junction of the cylinder valve and cylinder, do not try to repair it. Contact the supplier and ask for response instructions.

9.2.6.3.5.5. Never use a flame to detect a gas leak. Use soapy water.

9.2.6.3.5.6. After the cylinder is no longer needed, the following steps should be taken:

9.2.6.3.5.6.1. Do not completely empty the cylinder; always leave some residual pressure.

9.2.6.3.5.6.2. If the cylinder is empty, replace the cap and remove it to the empty cylinder storage area.

9.2.6.3.5.6.3. Label all empty cylinders with tags so that everyone will know their status. Empty cylinders can be marked with “MT and date” with chalk.

9.2.6.3.5.6.4. Handle empty cylinders as carefully as full ones; residual pressure can be dangerous.

9.2.6.3.5.6.5. Never refill a cylinder. This requires specialized equipment and techniques.

9.2.6.3.5.6.6. Never mix gases in a cylinder. The next person who draws from it may unknowingly cause an explosion.

9.2.6.3.6. **Piping for Compressed Air.**

9.2.6.3.6.1. Polyvinyl chloride (PVC) plastic pipes cannot be used for transporting compressed gases aboveground unless they are completely enclosed in a conduit or casing of sufficient strength to provide protection from external damage and deterioration. The heat generated from compressed air can weaken the PVC pipe and create an explosion hazard. When PVC piping explodes, plastic shrapnel pieces can be thrown in all direction and injure workers or damage equipment.

9.2.6.3.6.2. Copper piping shall not be used for acetylene.

9.2.6.3.6.3. Do not use cast iron pipe for chlorine.

9.2.6.3.6.4. Distribution lines and their outlets need to be clearly labeled.

9.2.6.3.6.5. Inspect piping systems on a regular basis.

9.2.6.3.6.6. Pay attention to fittings as well as possible cracks that may have developed.

9.2.6.3.7. **Hoses and Connections.**

9.2.6.3.7.1. Examine hoses regularly for leaks, set up an inspection schedule.

9.2.6.3.7.2. Do not use unnecessarily long hoses.

9.2.6.3.7.3. Keep hoses free from kinks and away from high traffic areas.

9.2.6.3.7.4. Repair leaks promptly and properly.

9.2.6.3.7.5. Store hoses in a cool place, and protect them from hot objects, and sparks.

9.2.6.3.7.6. Do not use a single hose having more than one gas passage.

9.2.6.3.7.7. Hoses with damaged casings, bulges or cracks must be removed from service and disposed of.

9.2.6.4. **Oxygen.**

9.2.6.4.1 **Note:** Oxygen is not compressed air; it is oxygen.

9.2.6.4.2. Never use oxygen as a substitute as a “compressed air” to run pneumatic tools, in oil heating burners, to start internal combustion engines, to blow out pipelines, or to create pressure for ventilation.

9.2.6.4.2.1. Oxygen cylinder valves should be opened all of the way during use.

9.2.6.4.2.2. Gaseous Oxygen shall not be stored within 20 feet of combustible material (especially oil and grease), spare/extra acetylene cylinders, or other fuel gas cylinders.

9.2.6.4.2.3. Oxygen and acetylene cylinders can be secured on a welding cart with regulator and hoses only when regularly used.

9.2.6.4.2.4. If the cart is not used several times a week, the regulators shall be removed and the cylinders properly stored.

9.2.6.4.2.5. Do not use synthetic straps for securing O2 cylinders.

9.2.6.5. **Propane.** Liquid Petroleum Gas (LPG, otherwise known as Propane).

9.2.6.5.1. LPG tanks must be stored outside, a minimum of 5 feet from exit doors and windows, 10 feet from exit doors which serve as the only exit, and 20 feet from any automotive fuel pump station.

9.2.6.5.2. Storage areas must be labeled as Flammable Gas.

9.2.6.5.3. LPG shall not be stored inside an enclosed flammable storage cabinet.

9.2.6.5.4. All cylinders shall be treated as if they are full if they have never contained gas.

9.2.6.5.5. Keep cylinder valve closed whenever not in use.

9.3. Workplace Electrical Safety.

9.3.1. **Hazards.** Electrical installations and equipment present a shock or electrocution hazard from contact with energized systems and can produce arc flash burns from electrical arcs. Excessive scraping, kinking, stretching and exposure to grease and oils damages power cables, leads to premature failure and causes shocks or burns. Fires can be caused by short circuits, over-heated equipment, or failure of current limiters, thermal sensors and other devices. Explosions may occur if flammable liquids, gases or dusts are exposed to ignition sources generated from electrical equipment.

9.3.2. **Receptacles.** Electrical receptacles and cover plates shall be free of cracks and securely mounted. Receptacle covers with cracks which expose the interior of the receptacle shall be replaced. It is not necessary to replace the cover for small cracks around the mounting screws. Receptacles in damp or wet locations shall meet National Electrical Code (NEC) requirements and be protected by ground fault circuit interrupter(s) (GFCI). Refer to paragraph **9.3.6.5.** for guidance on GFCIs.

9.3.2.1. Multiple plug adapters (power strips or plug multipliers) shall not be combined to provide additional or more convenient outlets as this could overload electrical circuits. At no time shall a multiple plug adapter or strip be plugged into another multiple plug adapter or strip.

9.3.3. **Flexible Cords and Extension Cords.** Flexible cords and extension cords shall be used IAW guidance outlined in the NEC. Electrical cords shall not be subjected to electrical currents or voltages greater than their rated capacities.

9.3.3.1. Portable cord and plug connected equipment and extension cords must be visually inspected before use on any shift for external defects such as loose parts, deformed and missing pins, or damage to outer jacket or insulation, and for possible internal damage such as pinched or crushed outer jacket.

9.3.3.2. Any defective cord or cord-and-plug-connected equipment must be removed from service and no person may use it until it is repaired by an electrician and tested to ensure it is safe for use.

9.3.3.3. Extension cords are considered by the NEC to be temporary wiring. Extension cords may be use when it is impractical to connect directly to the facility wiring, such as block heaters for equipment parked in unheated/outdoor parking.

9.3.3.3.1. General guidance of use of extension cords includes:

9.3.3.3.1.1. Do not run cords through holes in walls, ceilings, floors, doorways, windows, etc.

9.3.3.3.1.2. Do not run cords where concealed behind walls, dropped ceilings, or floors.

9.3.3.3.1.3. Do not tape, staple, or tack extension cords to building surfaces.

9.3.3.3.1.4. Cords shall not be spliced, taped, pinched, coiled, or otherwise placed where they may be damaged or create a hazard.

9.3.3.3.1.5. Electrical extension cords shall not be walked on nor equipment allowed to run over them. If cords must be placed in travel lanes, they shall be properly protected by molded housings, bridges or other covers approved for such use.

Table 9.2. Cord Gauge Chart

CORD LENGTH	DEVICE AMPERAGE RATING	GOOD FOR USE WITH	MINIMUM WIRE GAUGE
25 Feet	1 – 13 Amps	Christmas lights Work lights Portable fans Hedge trimmers	16 Gauge - (Light Duty)
25 Feet	14 – 15 Amps	Lawn mowers Power drills Table saws	14 Gauge - (Medium Duty)
25 Feet	16 – 20 Amps	• Chain Saws • Circular saws • Shop vacs • Air Compressors	12 Gauge - (Heavy Duty) 10 Gauge - (Extra Heavy Duty)
50 Feet	1 – 13 Amps	• Christmas lights • Work lights • Portable fans • Hedge trimmers	16 Gauge - (Light Duty)
50 Feet	14 – 15 Amps	• Lawn mowers • Power drills • Table saws	14 Gauge - (Medium Duty)
50 Feet	16 – 20 Amps	• Chain saws • Circular saws • Shop vacs	12 Gauge - (Heavy Duty) 10 Gauge - (Extra Heavy Duty)

100 Feet	1 – 10 Amps	• Christmas lights • Work lights • Portable fans • Hedge trimmers	16 Gauge - (Light Duty)
100 Feet	11 – 13 Amps	• Lawn mowers/li> • Power drills • Table saws	14 Gauge - (Medium Duty)
100 Feet	14 – 15 Amps	• Chain saws • Circular saws • Shop vacs	12 Gauge - (Heavy Duty)
100 Feet	16 – 20 Amps	• Air compressors	10 Gauge - (Extra Heavy Duty)
150 Feet	1 – 7 Amps	• Christmas lights • Work lights • Portable fans	14 Gauge - (Medium Duty)
150 Feet	8 – 10 Amps	• Lawn mowers • Power drills	12 Gauge - (Heavy Duty)
50 Feet	11 – 15 Amps	• Table saws • Chain saws • Circular saws • Shop vacs	10 Gauge - (Extra Heavy Duty)

9.3.3.3.1.6. Cords shall not be kinked, stretched, or bent excessively to prevent internal wire damage.

9.3.3.3.1.7. Cords shall be disconnected when not in use and at the end of the work shift. Exception: Low amp devices such as wall clocks, pencil sharpeners, radios, desk lamps, etc., do not have to be disconnected.

9.3.3.3.1.8. Extension cords used with portable tools and equipment shall have three-prong plugs. Two-wire extension cords are prohibited. Exception: Low amp devices such as wall clocks, pencil sharpeners, radios, desk lamps, etc.

9.3.3.3.1.9. The extension cord capacity shall be equal to or greater than the amperage rating of item being powered from the cord. See **Table 9.2.**

9.3.3.3.1.10. Extension cords and surge protectors shall not be combined or series-connected, i.e., daisy chained or piggy-backed.

9.3.3.3.1.11. Only commercially procured extension cords bearing the Underwriters Laboratory (UL) certification may be used. Extension cords may not be home-made or altered.

9.3.3.3.1.12. Do not hang extension cords over nails, rafters, or in any other manner that constitutes a safety or fire hazard.

9.3.3.3.1.13. Do not place extension cords under rugs, carpets, or other combustible material.

9.3.3.4. High wattage appliances such as heat-producing appliances, refrigerators of all types, coffee makers, etc., shall be plugged directly into a facility outlet. Coffee makers shall be unplugged at the end of the work shift. Exception: Commercial coffee urns hard plumbed to the water service and coffee makers/machines with integral timers, i.e., Bunn-style coffee brewers, need not be unplugged at the end of the work day if they are in an occupied/observable space.

9.3.3.5. Multi-receptacle surge protectors shall only be used to power low wattage items such as computers and related equipment such as lights or fans. Surge protectors nor extension cords shall be used with high wattage items such as coffee makers, refrigerators, microwave ovens, heaters, food preparation equipment, etc. Equipment plugged into surge protectors/extension cords shall not exceed the capacity of the surge protector/electrical cord. See **Table 9.2**.

9.3.4. **Portable Electrical Tools and Equipment.**

9.3.4.1. Tools and equipment connected by flexible cords shall be grounded by a three-wire cord or separate ground wire (except double-insulated equipment). A grommet, stress relief device or NEC approved clamp shall be installed on equipment housings to prevent abrasion of cord insulation and to prevent pull or strain put on the cord‘s internal wiring.

9.3.4.2. Portable equipment must be handled in a manner that will not cause damage to the equipment or its electrical cord. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment.

9.3.4.3. Users shall inspect cords frequently for signs of fraying, cracking, wearing or damage that could create a short-circuit. Defective electrical equipment and cords shall be removed from service.

9.3.4.4. When disconnecting cords, pull on the plug rather than the cord, to avoid damaging internal connections.

9.3.5. **Guarding of Live Parts.** Electrical outlets, switches, junction boxes, etc., shall be in good condition and have cover plates securely installed. Outlets, switches, cover plates, etc., shall be free of cracks or defects that could cause them to be ineffective. Minor superficial cracks at the installation screws that do not expose internal wires do not require replacement.

All unused openings (knock out plugs) in switch housings, junction boxes, etc., shall be securely covered. Rigid conduit shall be securely attached to the box and flexible conduit firmly secured where the conduit enters the box to prevent abrasion to the conduit and strain on the connecting points.

9.3.6. **Electrical Installations and Equipment.** Follow guidance in NFPA 70, NFPA 70E, 29 CFR 1910 Subpart S – Electrical for electrical installations and equipment.

9.3.6.1. Electrical Repairs. Only authorized, qualified electricians, or appliance workers may install or repair electrical equipment. Work on electrical equipment will be de-energized, locked out and tagged out IAW Chapter 13, Control of Hazardous Energy of this safety manual.

9.3.6.2. Supervisors shall ensure work areas are inspected for electrical hazards. 30-inch clearance will be maintained in front of all electrical controls/circuit panels.

9.3.6.3. Wires shall be enclosed in an electrically-listed box or control panel.

9.3.6.4. Keep all rack/panel/control box doors closed at all times except as necessary to accomplish authorized repairs.

9.3.6.5. Ground Fault Circuit Interrupters (GFCI) shall be used on all 120-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets located in wet areas. To protect large areas, GFCI breakers may be used.

9.3.6.5.1. Wet areas include bathrooms, outdoors, kitchens, garages, workshops, or any electrical receptacles located within six (6) feet of any water source, e.g., sinks, water coolers, water fountains, etc.

9.3.7. **Electrical Grounding.**

9.3.7.1. Extension cords used with grounding type equipment must contain an equipment-grounding conductor (i.e., the cord must accept a three-prong, or grounded, plug).

9.3.7.2. Attachment plugs and receptacles may not be connected or altered in any way that would interrupt the continuity of the equipment grounding conductor.

9.3.7.3. Clipping the grounding prong from an electrical plug is prohibited.

9.3.7.4. Flexible cords may only be plugged into grounded receptacles.

9.3.7.5. Adapters that interrupt the continuity of the equipment grounding connection may not be used.

9.3.7.6. All portable electric equipment and flexible cords used in highly conductive work locations, such as those with water or other conductive liquids, or in places where employees are likely to contact water or conductive liquids, must be approved for those locations.

9.3.7.7. Employee's hands must be dry when plugging and unplugging flexible cords and cord-and-plug connected equipment if energized equipment is involved. If the connection could provide a conducting path to employees hands (for example, if a cord connector is wet from being immersed in water), the energized plug and receptacle must be de-energized before disconnecting.

9.3.8. **Workplace Lighting.** Control of light is important to avoid glare and harsh shadows. Soft shadows are usually acceptable, but harsh shadows shall be avoided since they may obscure hazards or interfere with visibility. Supplementary lighting or additional lighting shall be provided where general lighting is not sufficient. Lamps for general illumination must be protected from breakage.

9.3.8.1. Temporary lights must not be suspended by their cords unless they have been designed for this purpose.

9.3.8.2. Portable lighting used in wet or conductive locations must be protected by GFCI's.

9.4. Emergency Actions.

9.4.1. **Emergency Action Plans.** ITD Headquarters, districts, compounds, sheds, and occupied facilities will have an Emergency Action Plan (EAP) suitable for their facility/compound. Refer to the ITD Emergency Procedure Guide (This guide meets the required EAP).

9.4.1.1. The Emergency Action Plan (EAP) Must:

9.4.1.1.1. Be in writing

9.4.1.1.2. Have site map(s) posted in common areas

9.4.1.1.3. Have designated exit route(s)

9.4.1.1.4. Have designated assembly area(s)

9.4.1.1.5. Must be kept in the workplace

9.4.1.1.6. Must be available to employees for review

9.4.1.1.7. EAPs Must Address Training in:

9.4.1.1.7.1. Exit route(s)

9.4.1.1.7.2. Assembly area(s)

9.4.1.1.7.3. Procedures once at assembly area(s)

9.4.1.1.7.4. Roll call

9.4.1.1.7.5. Status of those not there

9.4.1.1.7.6. Status given to Emergency Medical/Fire Services once on scene.

9.4.1.1.7.8. Status as to when to return to facility

9.4.1.1.7.9. Relocate to optional area/building

9.4.2. Evacuation Plan.

9.4.2.1. Evacuate the building in a safe and orderly manner as quickly as possible. **Do not go back** in to get personal items.

9.4.2.2. Assist anyone with disabilities.

9.4.2.3. **Do not use elevator.** Do not run. Try to stay calm.

9.4.2.4. Ensure all doors are closed when leaving. This includes all interior office doors.

9.4.2.5. Assemble in (determined in specific Districts) for a head count.

9.4.2.6. If weather is severe, alternate instructions will be given after meeting in the parking lot.

9.4.2.7. Each section supervisor is to assure that all persons in their respective area have evacuated.

9.4.2.8. If there are non-employee guests present during evacuation, ITD personnel will assist them in the evacuation, and escort them to the designed assembly area.

9.2.4.9. Evacuation procedures should be addressed at all meetings and training sessions, especially those that include non-ITD personnel.

9.2.4.10. Upon exiting the building, DO NOT re-enter the building or leave the designated assembly area until notified to do so by the supervisor in charge.

9.2.4.11. Remember if possible; take guest sign in sheets, class rosters, etc. when leaving the building.

9.2.4.12. Each section supervisor will report section status to the District Engineer, Operations Engineer, Engineering Manager, Administration Manager or Safety & Compliance Officer, in descending order if DE is not on site.

9.2.4.13. Return to the building only when advised that it is safe to do so. If the facility is determined to be unsafe, alternate instructions will be provided.

9.4.3. **Emergency Procedures.** The EAP must identify emergency contact numbers. Modify this list to indicate exact calling numbers for your phone system/local area.

In an emergency immediately call appropriate No.:

9.4.3.1. Police, Fire Paramedics 9-911* (or)

9.4.3.2. Includes TDD-Telecommunications for the Deaf

9.4.3.3. Police (Non-Emergency) No.____

9.4.3.4. Building Superintendent No. ____

9.4.3.5. ID State Com Dispatch: 9-1-888-575-2666

9.4.3.6. Idaho Poison Control: 1-800-222-1222

9.4.3.7. ITD Emergency Hotline: 1-877-281-0994

9.4.3.8. ITD Employee Safety & Risk Manager: 208-334-8038

9.4.3.9. ~~Emergency Management Planner~~ ITD Office of Emergency Management: 208-334-8414

9.4.3.10. Hazardous Materials Coordinator: HQ or Districts No.

9.4.3.11. Public Information: 9-1-208-334-8005

9.4.3.12. (Coordination Only) State Security Manager (Dept. of Administration) 208-332-1960

9.4.3.13. Try and remain calm

9.4.3.14. Make sure scene is safe

9.4.3.15. Do not post real world or exercise events on social media

9.4.4. **Medical Emergencies.**

9.4.4.1. Check if the scene is safe to enter.

9.4.4.2. Unconscious Victims:

9.4.4.2.1. Yell for help.

9.4.4.2.2. Call or have someone call 9-911.

9.4.4.2.3. Send a runner to bring an AED (if available)

9.4.4.2.4. Clear the victim's airway.

9.4.4.2.5. Check for breathing.

9.4.4.2.6. Check for pulse.

9.4.4.2.7. Start CPR. Refer to ITD Emergency Procedure Guide medical section.

9.4.4.2.8. Immediately turn on AED unit when it arrives.

9.4.4.2.9. Follow AED unit's instructions.

9.4.4.3. Conscious Victims:

9.4.4.3.1. Check if the scene is safe to enter.

9.4.4.3.2. Yell for help.

9.4.4.3.3. Call or have someone call 9-911.

9.4.4.3.4. Do not move the patient or allow him/her to move.

9.4.4.3.5. Try to control any heavy bleeding using direct pressure on the wound.

9.4.4.3.6. Try to keep the patient from going into shock.

9.4.4.3.7. Keep patient warm.

9.4.4.3.8. Keep patient comfortable.

9.4.4.3.9. Elevate lower extremities if possible.

9.4.5. **Fires Emergencies.**

9.4.5.1. Activate the fire alarm.

9.4.5.2. Alert others.

9.4.5.3. If fire is small, attempt to put it out with extinguisher.

9.4.5.4. Proceed to the nearest exit.

9.4.5.5. Follow emergency personnel/ITD responders/evacuation directions.

9.4.5.6. Evacuate the building.

9.4.5.7. Feel the top of doors, if a door is hot or smoke is visible, do not open it.

9.4.5.8. Do not use elevators.

9.4.5.9. If already in elevator do not push the emergency button (car will return to ground floor).

9.4.5.10. Advancing through flames (if forced to do so).

9.4.5.11. Hold your breath.

9.4.5.12. Move quickly.

9.4.5.13. Cover your head.

9.4.5.14. Cover your hair.

9.4.5.15. Keep your head down.

9.4.5.16. Keep your eyes closed as much as possible.

9.4.5.17. If clothing is burning, **stop, drop**, and **roll**.

9.4.6. **Fire Extinguisher Use.**

9.4.6.1. Use fire extinguishers on small fires only.

9.4.6.2. Remember the **PASS** acronym:

9.4.6.2.1. **P**ull the safety in from the extinguisher handle.

9.4.6.2.2. **A**im the nozzle at the base of the fire.

9.4.6.2.3. **S**queeze the trigger handle.

9.4.6.2.4. **S**weep the spray from side to side.

9.4.7. **Power Outages (During Work Hours).**

9.4.7.1. Keep calm.

9.4.7.2. Use flashlight or cell phone to make it out of dark area.

9.4.7.3. Do not call power company. Facility Management will call power company.

9.4.7.4. If trapped in elevator remain calm.

9.4.7.5. Reassure others if trapped with you.

9.4.7.6. Push Emergency Call Button.

9.4.7.7. Wait for assistance.

9.4.7.8. Alternatively, if possible call 9-1-1 from cell phone.

9.4.7.9. Report your location.

9.4.7.10. Report how many are trapped.

9.4.7.11. Wait for assistance.

9.4.7.12. Supervisors will notify employees of what actions will be taken based on duration of outage and time of day.

9.4.8. **Power Outages (After Work Hours).**

9.4.8.1. Response from Building Services and ETS.

9.4.8.2. Facilities Management will be notified by Idaho Power and Johnson Electrical.

9.4.8.3. ETS is notified by email from server room.

9.4.8.4. Generators will automatically switch on – kept at full fuel capacity.

9.4.8.5. Alert Sense will notify required personnel of power outage, major issues and power restoration.

9.4.8.6. Notifications are made on an as needed basis.

9.4.8.7. Generators fail to automatically switch on.

9.4.8.8. Facility Management will evaluate and make notifications as necessary.

9.4.8.9. **Note:** Facility Management will be the incident commander.

9.4.8.10. Facility Mgt/ETS will maintain a current list of all equipment connected to the generator in their respective office.

9.4.9. **Active Assailant-Workplace Violence (Active Shooter) Response.**

9.4.9.1. Emergency Responders, Administration, Employee Safety and Building Services.

9.4.9.2. Three primary active shooter responses: Run, Hide, and Fight.

9.4.9.3. Be aware of your environment and any possible dangers.

9.4.9.4. Call 9-911 when it is safe to do so and report:

9.4.9.4.1. **Where**—your location and location of the shooter (if known).

9.4.9.4.2. **Who**—a physical description of the shooter.

9.4.9.4.3. **What**—the number and type of weapons involved.

9.4.9.5. **How Many**—the number of potential victims, if possible.

9.4.9.6. Stay calm, move quickly to a safe area and do not panic.

9.4.9.7. If you are in a hall, go to the nearest room that can be secured.

9.4.9.8. Shut and barricade the door.

9.4.9.9. If safe to do so turn off lights to make room look unoccupied.

9.4.9.10. Hide yourself by going behind or under a desk.

9.4.9.11. Turn off your cell phone ringer as it could identify your location.

9.4.9.12. If hiding, stay there until law enforcement officers tell you it is safe to leave.

9.4.9.13. If it is safe to flee from an office or building, do not take anything with you.

9.4.9.14. Only as a last resort, attempt to disarm or disable a shooter.

9.4.9.15. When law enforcement officers arrive:

9.4.9.15.1. Follow their exact instructions.

9.4.9.15.2. Remain calm.

9.4.9.15.3. Put down any items in your hands, raise your hands and spread your fingers.

9.4.9.15.4. Make sure responding officers can see your hands at all times.

9.4.9.15.5. Avoid making any quick movement or hand gestures toward an officer, to keep from being mistaken as a shooter.

9.4.10. **Suspicious Mail Response.**

9.4.10.1. Hazmat Team, Building Services/Facilities Manager, and Employee Safety.

9.4.10.2. Certain characteristics may indicate a suspicious or hazardous letter or parcel.

9.4.10.3. Please refer to USPS Suspicious Mail or Package Identification Guide below:

9.4.10.4. Handling a suspicious unopened letter.

9.4.10.5. Set if down and do not shake it.

9.4.10.6. Take a picture from your cell phone for 1st responders.

9.4.10.7. Immediately call your supervisor, 9-911 and evacuate the immediate area.

9.4.10.8. Ensure upper management is notified.

9.4.10.9. Wash your hands with soap and water.

9.4.10.10. Wait for First Responders in close proximity to the area.

9.4.10.11. Do not touch other employees, doors, computer equipment, etc.

9.4.10.12. Powder Spill from an Envelope:

9.4.10.12.1. Do not clean the spill or released substance.

9.4.10.12.2. Keep others away.

9.4.10.12.3. Call 9-911.

9.4.10.12.4. Notify your supervisor.

9.4.10.12.5. Close the door.

9.4.10.12.6. Evacuate the immediate area.

9.4.10.12.7. Shut off direct air sources.

9.4.10.12.8. Notify Facility Manager to shut off HVAC system.

9.4.10.12.9. Avoid the area containing the envelope, but remain in close proximity.

9.4.10.12.10. Wait for further instructions from supervisor, ITD responders, and emergency responders.

9.4.10.12.11. Wash hands with soap and water.

9.4.10.12.12. Encourage any others to wash hands with soap and water.

9.4.10.12.13. Do not brush substance off your clothes.

9.4.10.12.14. Make a list of all people who came into contact with it.

9.4.10.12.15. Make a list of your movements after handling the suspicious letter (i.e. office cubicle, rest room, elevator, etc.)

9.4.11. **Bomb Threat.**

9.4.11.1. Remain calm and listen; do not interrupt caller.

9.4.11.2. Keep caller talking as long as possible.

9.4.11.3. Record on ITD form 002:

9.4.11.3.1. Date Received

9.4.11.3.2. Time Received

9.5. Asbestos.

9.5.1. The term Asbestos refers to a family of six naturally occurring minerals that are mined throughout the world:

9.5.1.1. Chrysotile (white)

9.5.1.2. Amosite (brown / off-white)

9.5.1.3. Crocidolite (blue)

9.5.1.4. Tremolite

9.5.1.5. Actinolite

9.5.1.6. Anthophyllite

9.5.2. Of these six, Chrysotile is the most common, but it is not unusual to encounter Amosite or Crocidolite as well.

9.5.3. All types of asbestos tend to break into very tiny fibers. These individual fibers are so small that many must be identified using a microscope. In fact, some individual fibers may be up to 700 times smaller than a human hair. Because asbestos fibers are so small, once released into the air, they may stay suspended for hours or even days.

9.5.4. Asbestos fibers are also virtually indestructible. They are resistant to chemicals and heat, and they are very stable in the environment. They do not evaporate into air or dissolve in water, and they are not broken down over time. These characteristics make Asbestos ideal for many building materials.

9.5.5. **Definitions.**

- **Asbestos-Containing Materials (ACM):** Any materials containing more than 1% asbestos. A few common examples of ACM include: pipe and boiler insulation (TSI), sprayed on fire proofing, troweled or acoustical plaster, floor tiles and mastic, linoleum, transite shingles, transite lab bench tops, roofing materials, wall and ceiling plaster, joint compound, ceiling tiles, blackboards, mastics, and gasket materials.
- **Presumed Asbestos-Containing Materials (PACM):** Any surfacing material, TSI, or resilient floor coverings present in buildings constructed prior to 1980 are assumed to contain greater than one percent asbestos unless they have been sampled to negate the presence of asbestos.
- **Suspect Asbestos-Containing Materials:** Any material that may contain more than one percent asbestos, but has not been sampled and tested to determine its asbestos content.
- **Asbestos-Containing Flooring Material (ACFM):** This group includes vinyl asbestos tile (VAT), linoleum and/or the mastic that adheres the VAT or linoleum to the sub-floor.
- **Authorized Person:** Any person authorized by the employer and required by work duties to be present in regulated areas.
- **Employee Exposure:** Exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.
- **High-efficiency Particulate Air (HEPA) Filter:** A filter capable of trapping and retaining at least 99.97 percent of 0.3 micrometer diameter mono-disperse particles.
- **Industrial Hygienist:** A professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards.

9.5.6. **Where Asbestos can be Found.** Asbestos may be found in many different products and locations. Examples of ACMs include, (but are not limited to):

9.5.6.1. Wall and ceiling insulation

9.5.6.2. Siding shingles on old residential buildings

9.5.6.3. Putties, caulks, and cements (such as in chemical carrying cement pipes)

9.5.6.4. Sprayed-on fire proofing and insulation in buildings

9.5.6.5. Joint compound in older pipes and boilers insulation

9.5.6.6. Ceiling tiles in buildings built prior to 1981

9.5.6.8. Many 12" floor tiles in buildings built prior to 1981

9.5.6.9. Most 9" floor tiles in buildings

9.5.6.10. Interiors of fire doors

9.5.6.11. Brake linings and clutch pads

9.5.6.12. Old fume hoods and lab benches

9.5.7. **Policy.**

9.5.7.1. All asbestos-containing materials in ITD owned buildings and facilities shall be managed to minimize the exposure of employees and the environment to asbestos.

9.5.7.2. All activities that may impact, disturb or dislodge asbestos fibers are to be conducted and abated in a manner consistent with the procedures below and in compliance with applicable State and Federal asbestos abatement regulations.

9.5.7.3. Licensed, third party asbestos abatement personnel shall be used to take samples from ITD owned & leased buildings to determine whether or not they contain asbestos. Never try to take a sample yourself unless you are licensed to do so.

9.5.7.4. If you have reason to suspect that something is asbestos, either because it is labeled as such, or because it’s something that is likely to contain asbestos (9" floor tile, for example), **do not disturb it**.

9.5.8. **Procedure.**

9.5.8.1. The District Facilities coordinator (DFC) and Headquarters Facilities Manager (HFM) shall write and maintain an Asbestos Management Plan which establishes asbestos operations, maintenance, and inspection procedures.

9.5.8.2. Prior to the start of any renovation, demolition project, or facilities repair activities, the DFC & HFM must be contacted to coordinate a survey for suspect and known asbestos containing materials in the project area. Any suspect asbestos containing material identified in the project area, that may be impacted or disturbed, must be either

sampled and tested to determine its asbestos content or assumed to contain asbestos and managed as an asbestos containing material.

9.5.8.3. Any materials known or identified to be ACM that will be impacted or disturbed as a result of renovation or demolition activity must be properly abated in accordance with Department of Environmental Quality Regulations, and OSHA Asbestos Standards. The DFC & HFM will determine the proper abatement methods to be used.

9.5.8.4. Asbestos abatement projects, must be coordinated, supervised and monitored by the Headquarters Facilities Manager & District Facilities Coordinator.

9.5.8.5. Any ITD employee or contractor that identifies any damaged, suspect or known asbestos containing materials shall notify the DFC & HFM immediately upon identification. The DFC & HFM will assess the situation, arrange for the appropriate corrective actions, and notify the regulatory agencies as necessary.

9.5.9. **Training and Medical Surveillance.**

9.5.9.1. Employees who work (conduct surveys, sampling, or abatement activities) with asbestos as part of their work should receive an asbestos physical, including medical clearance to use a respirator. Any employee who may be working on asbestos abatement should contact the ESRM or District Safety Compliance Officer (SCO) to enroll in the program.

9.5.9.2. **Note:** OSHA's asbestos standard for general industry at 29 CFR 1910.1001(j)(7)(iv) requires employers to provide an asbestos awareness training course for employees who perform housekeeping operations in areas where an asbestos-containing material (ACM) or presumed asbestos-containing material (PACM) is present. The elements of the course must include the health effects of asbestos; locations, signs of damage and deterioration of ACM and PACM; the proper response to fiber release episodes; and the standard's requirements related to housekeeping. This training must be held annually and conducted so that all employees understand it.

9.5.9.3. In order to comply with the note above; All ITD employees shall complete Asbestos Awareness Training (located on the learning hub) annually.

9.5.9.4. OSHA and DEQ regulations on asbestos require that building materials be sampled prior to demolition, replacement, or remodeling.

9.6. Office Safety.

All employees have an individual responsibility to practice work area safety and know the location of safety equipment in their work area and how to use it.

9.6.1. **Fire Prevention and Safety.**

9.6.1.1. Know the location of fire extinguishers and how to properly use them. Know the location of fire alarms and evacuation routes. If a fire occurs, get out quickly. **Never** use an elevator during a fire evacuation.

9.6.1.2. Properly store and dispose of all materials that may be fire hazards, including cleaning fluids, photocopier inks, and oily or solvent-soaked rags.

9.6.1.3. Do not overload electrical circuits. Check with Facilities Maintenance or the District Electrician before adding new equipment in your office.

9.6.1.3.1. Use proper extension cords, power strips, and outlets.

9.6.1.3.2. All appliances (coffee makers, microwaves, heating units etc.) are to be cleared by Facilities Maintenance or the District Electrician before using.

9.6.1.3.3. All computer equipment should be cleared and installed by Information Services prior to use.

9.6.2. **Walking Areas and Surfaces.**

9.6.2.1. Power and telephone cords shall not be located across walking areas.

9.6.2.2. Area rugs should be kept flat on the floor.

9.6.2.3. Spills and objects dropped on the floor should be picked up as soon as possible to avoid slips, trips or falls.

9.6.2.4. Walkways must be at least 36” wide. Do not stack or store materials in the walkway.

9.6.2.5. Outdoor walking areas and parking lots shall be cleared of snow & ice as quickly as feasible after a storm event (HQ Facilities & District Maintenance forces will be responsible for completion of this task).

9.6.3 **Office Equipment.**

9.6.3.1. If sitting in a legged chair; keep all four legs of your chair on the floor at all times. Tilting back in a chair often results in head injuries sustained from falling backwards.

9.6.3.2. Rolling chairs must have at least 5 wheels on them and should be removed from service if damaged.

9.6.3.3. Keep all desk and file cabinet drawers closed when not in use.

9.6.3.4. Do not stack materials on top of file cabinets.

9.6.3.5. Personnel should not move heavy objects or equipment by themselves. Make sure that staff has proper equipment for moving heavy objects. (At HQ, contact Facilities Maintenance).

9.6.4. **Office Machines.**

9.6.4.1. Learn how to operate machines safely before attempting to use them.

9.6.4.2. Check all electrical cords frequently for breaks or worn areas.

9.6.4.3. Do not attempt to make repairs and adjustments unless you are qualified to do so.

9.6.5. **Work Stations.** A properly adjusted computer workstation is critical to employee health & safety.

9.6.5.1. Neutral body positioning is a comfortable working posture in which your joints are naturally aligned. Working with the body in a neutral position reduces stress and strain on the muscles, tendons, and skeletal system and reduces your risk of developing a musculoskeletal disorder (MSD). The following are important considerations when attempting to maintain neutral body postures while working at the computer workstation:

9.6.5.1.1. Hands, wrists, and forearms are straight, in-line and roughly parallel to the floor.

9.6.5.1.2. Head is level, forward facing, and balanced. Generally it is in-line with the torso.

9.6.5.1.3. Shoulders are relaxed and upper arms hang normally at the side of the body.

9.6.5.1.4. Elbows stay in close to the body and are bent between 90 and 120 degrees.

9.6.5.1.5. Feet are fully supported by the floor or a footrest may be used if the desk height is not adjustable.

9.6.5.1.6. Back is fully supported with appropriate lumbar support when sitting vertical or leaning back slightly.

9.6.5.1.7. Thighs and hips are supported and generally parallel to the floor.

9.6.5.1.8. Knees are about the same height as the hips with the feet slightly forward.

9.6.5.2. Regardless of how good your working posture is, working in the same posture or sitting still for prolonged periods is not healthy. You should change your working position frequently throughout the day in the following ways:

9.6.5.2.1. Make small adjustments to your chair or backrest.

9.6.5.2.2. Stretch your fingers, hands, arms, and torso.

9.6.5.2.3. Stand up and walk around for a few minutes periodically.

9.6.5.2.4. Perform some of your tasks while standing: computing, reading, phone, meetings.

9.7. Hand Tools and Portable Power Tools.

9.7.1. General.

9.7.1.1. Employees who use hand and power tools and are exposed to the hazards of falling, flying, abrasive, and splashing objects, or to harmful dusts, fumes, mists, vapors, or gases must be provided with the appropriate personal protective equipment. All electrical connections for these tools must be suitable for the type of tool and the working conditions (wet, dusty, flammable vapors). When a temporary power source is used for construction a ground-fault circuit interrupter should be used.

9.7.1.2. Employees should be trained in the proper use of all tools. Workers should be able to recognize the hazards associated with the different types of tools and the safety precautions necessary.

9.7.1.3. Five basic safety rules can help prevent hazards associated with the use of hand and power tools:

9.7.1.3.1. Keep all tools in good condition with regular maintenance.

9.7.1.3.2. Use the right tool for the job.

9.7.1.3.3. Examine each tool for damage before use and do not use damaged tools.

9.7.1.3.4. Operate tools according to the manufacturers' instructions.

9.7.1.3.5. Provide and use properly the right personal protective equipment.

9.7.1.4. Employees and supervisors should work together to establish safe working procedures. If a hazardous situation is encountered, it should be brought immediately to the attention of the supervisor for hazard abatement.

9.7.2. Hand Tools.

9.7.2.1. Hand tools are tools that are powered manually. Hand tools include anything from axes to wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance.

9.7.2.2. The employer is responsible for the safe condition of tools and equipment used by employees. Employers shall not issue or permit the use of unsafe hand tools. Employees should be trained in the proper use and handling of tools and equipment.

9.7.2.3. Employees, when using saw blades, knives, or other tools, should direct the tools away from aisle areas and away from other employees working in close proximity. Knives and scissors must be sharp; dull tools can cause more hazards than sharp ones. Cracked saw blades must be removed from service.

9.7.2.4. Wrenches must not be used when jaws are sprung to the point that slippage occurs. Impact tools such as drift pins, wedges, and chisels must be kept free of mushroomed heads. The wooden handles of tools must not be splintered.

9.7.2.5. Iron or steel hand tools may produce sparks that can be an ignition source around flammable substances. Where this hazard exists, spark-resistant tools made of non-ferrous materials should be used where flammable gases, highly volatile liquids, and other explosive substances are stored or used.

9.7.3. **Power Tools.** For guidance on lawn mowers, line trimmers refer to **Chapter 12** of this manual. For guidance on chainsaws refer to **Chapter 10.8** of this manual.

9.7.3.1. Appropriate personal protective equipment such as hearing protection, safety goggles and gloves must be worn to protect against hazards that may be encountered while using hand tools.

9.7.3.2. Pavement saws, grinders, jackhammers and media blasters used on pavements produce respirable silica dust. Proper respiratory protection must be worn by all personnel in the vicinity of tools that produce silica dust.

9.7.3.3. Workplace floors shall be kept as clean and dry as possible to prevent accidental slips with or around dangerous hand tools.

9.7.3.4. Power tools must be fitted with guards and safety switches; they are extremely hazardous when used improperly. The types of power tools are determined by their power source: electric, pneumatic, liquid fuel, hydraulic, and powder-actuated.

9.7.3.5. To prevent hazards associated with the use of power tools, workers should observe the following general precautions:

9.7.3.5.1. Never carry or lift a tool by the cord or hose.

9.7.3.5.2. Never yank the cord or the hose to disconnect it from the receptacle.

9.7.3.5.3. Keep cords and hoses away from heat, oil, and sharp edges.

9.7.3.5.4. Disconnect tools when not using them, before servicing and cleaning them, and when changing accessories such as blades, bits, and cutters.

9.7.3.5.5. Keep all people not involved with the work at a safe distance from the work area.

9.7.3.5.6. Secure work with clamps or a vise, freeing both hands to operate the tool.

9.7.3.5.7. Avoid accidental starting. Do not hold fingers on the switch button while carrying a plugged-in tool.

9.7.3.5.8. Maintain tools with care; keep them sharp and clean for best performance.

9.7.3.5.9. Follow instructions in the user’s manual for lubricating and changing accessories.

9.7.3.5.10. Be sure to keep good footing and maintain good balance when operating power tools.

9.7.3.5.11. Wear proper apparel for the task. Loose clothing, ties, or jewelry can become caught in moving parts.

9.7.3.5.12. Remove all damaged portable electric tools from use and tag them: "Do Not Use."

9.7.3.6. **Guards.**

9.7.3.6.1. The exposed moving parts of power tools need to be safeguarded. Belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts of equipment must be guarded.

9.7.3.6.2. Machine guards, as appropriate, must be provided to protect the operator and others from the following:

9.7.3.6.2.1. Point of operation.

9.7.3.6.2.2. In-running nip points.

9.7.3.6.2.3. Rotating parts.

9.7.3.6.2.4. Flying chips and sparks.

9.7.3.6.3. Safety guards must never be removed when a tool is being used. Portable circular saws having a blade greater than 2 inches (5.08 centimeters) in diameter must be equipped at all times with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except where it makes contact with the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work material.

9.7.3.7. **Operating Controls and Switches.**

9.7.3.7.1. The following hand-held power tools must be equipped with a constant-pressure switch or control that shuts off the power when pressure is released: drills; tappers; fastener drivers; horizontal, vertical, and angle grinders with wheels more than 2 inches (5.08 centimeters) in diameter; disc sanders with discs greater than 2 inches (5.08 centimeters); belt sanders; reciprocating saws; saber saws, scroll saws, and jigsaws with blade shanks greater than 1/4-inch (0.63 centimeters) wide; and other similar tools. These tools also may be equipped with a "lock-on" control, if it allows the worker to also shut off the control in a single motion using the same finger or fingers.

9.7.3.7.2. The following hand-held power tools must be equipped with either a positive "on-off" control switch, a constant pressure switch, or a "lock-on" control: disc sanders with discs 2 inches (5.08 centimeters) or less in diameter; grinders with wheels 2 inches (5.08 centimeters) or less in diameter; platen sanders, routers, planers, laminate trimmers, nibblers, shears, and scroll saws; and jigsaws, saber and scroll saws with blade shanks a nominal 1/4-inch (6.35 millimeters) or less in diameter. It is

recommended that the constant- pressure control switch be regarded as the preferred device.

9.7.3.7.3. Other hand-held power tools such as circular saws having a blade diameter greater than 2 inches (5.08 centimeters), chain saws, and percussion tools with no means of holding accessories securely must be equipped with a constant-pressure switch.

9.7.3.8. **Electric Tools.**

9.7.3.8.1. Employees using electric tools must be aware of several dangers. Among the most serious hazards are electrical burns and shocks.

9.7.3.8.2. Electrical shocks, which can lead to injuries such as heart failure and burns, are among the major hazards associated with electric powered tools. Under certain conditions, even a small amount of electric current can result in fibrillation of the heart and death. An electric shock also can cause the user to fall off a ladder or other elevated work surface and be injured due to the fall.

9.7.3.8.3. To protect the user from shock and burns, electric tools must have a three-wire cord with a ground and be plugged into a grounded receptacle, be double insulated, or be powered by a low voltage isolation transformer. Three-wire cords contain two current carrying conductors and a grounding conductor. Three-wire cords must be plugged into a three-hole grounded receptacle. Electrical tools with three wire plugs missing the third ground plug will be removed from service and tagged “do not use”.

9.7.3.8.4. Double-insulated tools are available that provide protection against electrical shock without third-wire grounding. On double insulated tools, an internal layer of protective insulation completely isolates the external housing of the tool.

9.7.3.8.5. The following general practices should be followed when using electric tools:

9.7.3.8.5.1. Operate electric tools within their design limitations.

9.7.3.8.5.2. Use gloves and appropriate safety footwear when using electric tools.

9.7.3.8.5.3. Store electric tools in a dry place when not in use.

9.7.3.8.5.4. Do not use electric tools in damp or wet locations unless they are approved for that purpose.

9.7.3.8.5.5. Keep work areas well lighted when operating electric tools.

9.7.3.8.5.6. Ensure that cords from electric tools do not present a tripping hazard.

9.7.3.8.5.7. Electrical tools with cut, abraded or frayed electrical cords that expose the inner wires will be removed from service and tagged “do not use”.

9.7.3.9. **Portable Abrasive Wheel Tools.**

9.7.3.9.1. Portable abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments. Abrasive wheel tools must be equipped with guards that: (1) cover the spindle end, nut, and flange projections; (2) maintain proper alignment with the wheel; and (3) do not exceed the strength of the fastenings.

9.7.3.9.2. Before an abrasive wheel is mounted, it must be inspected closely for damage and should be sound- or ring-tested to ensure that it is free from cracks or defects. To test, wheels should be tapped gently with a light, non-metallic instrument. If the wheels sound cracked or dead, they must not be used because they could fly apart in operation. A stable and undamaged wheel, when tapped, will give a clear metallic tone or "ring."

9.7.3.9.3. To prevent an abrasive wheel from cracking, it must fit freely on the spindle. The spindle nut must be tightened enough to hold the wheel in place without distorting the flange. Always follow the manufacturer's recommendations. Take care to ensure that the spindle speed of the machine will not exceed the maximum operating speed marked on the wheel.

9.7.3.9.4. An abrasive wheel may disintegrate or explode during start-up. Allow the tool to come up to operating speed prior to grinding or cutting. The employee should never stand in the plane of rotation of the wheel as it accelerates to full operating speed. Portable grinding tools need to be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of wheel breakage.

9.7.3.9.5. When using a powered grinder:

9.7.3.9.5.1. Always use eye or face protection.

9.7.3.9.5.2. Turn off the power when not in use.

9.7.3.9.5.3. Never clamp a hand-held grinder in a vise.

9.7.3.10. **Pneumatic Tools. Note:** Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and safety glasses or face shield.

9.7.3.10.1. Pneumatic tools are powered by compressed air and include but are not limited to impact drivers, chippers, drills, nailers, staplers, and sanders.

9.7.3.10.2. There are several dangers associated with the use of pneumatic tools. First and foremost is the danger of getting hit by one of the tool's attachments or by a fastener fired from the tool.

9.7.3.10.3. Pneumatic tools must be checked to see that the tools are fastened securely to the air hose to prevent them from becoming disconnected. A short wire or positive

locking device attaching the air hose to the tool must also be used and will serve as an added safeguard.

9.7.3.10.4. If an air hose is more than 1/2-inch (12.7 millimeters) in diameter, a safety excess flow valve must be installed at the source of the air supply to reduce pressure in case of hose failure.

9.7.3.10.5. In general, the same precautions should be taken with an air hose that are recommended for electric cords, because the hose is subject to the same kind of damage or accidental striking, and because it also presents tripping hazards.

9.7.3.10.6. When using pneumatic tools, a safety clip or retainer must be installed to prevent attachments such as chisels on a chipping hammer from being ejected during tool operation.

9.7.3.10.7. Pneumatic tools that shoot nails, rivets, staples, or similar fasteners and operate at pressures more than 100 pounds per square inch (6,890 kPa), must be equipped with a special device to keep fasteners from being ejected, unless the muzzle is pressed against the work surface.

9.7.3.10.8. Airless spray guns that atomize paints and fluids at pressures of 1,000 pounds or more per square inch (6,890 kPa) must be equipped with automatic or visible manual safety devices that will prevent pulling the trigger until the safety device is manually released.

9.7.3.10.9. Eye protection is required, and head and face protection is recommended for employees working with pneumatic tools.

9.7.3.10.10. Screens must also be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers, or air drills.

9.7.3.10.11. Compressed air guns should never be pointed toward anyone. Workers should never “dead-end” them against themselves or anyone else.

9.7.3.10.12. Use of heavy jackhammers can cause fatigue and strains. Heavy rubber grips reduce these effects by providing a secure handhold. Workers operating a jackhammer must wear safety glasses and safety shoes that protect them against injury if the jackhammer slips or falls. A face shield also should be used.

9.7.3.10.13. Noise is another hazard associated with pneumatic tools. Working with noisy tools such as jackhammers requires proper, effective use of appropriate hearing protection.

9.7.3.11. **Liquid Fuel Tools.**

9.7.3.11.1. Fuel-powered tools are usually operated with gasoline. The most serious hazard associated with the use of fuel-powered tools comes from fuel vapors that can burn or explode and also give off dangerous exhaust fumes. The worker must be careful

to handle, transport, and store gas or fuel only in approved flammable liquid containers, according to proper procedures for flammable liquids.

9.7.3.11.2. Before refilling a fuel-powered tool tank, the user must shut down the engine and allow it to cool to prevent accidental ignition of hazardous vapors. When a fuel-powered tool is used inside a closed area, effective ventilation must be utilized to avoid breathing carbon monoxide. Fire extinguishers must also be available in the area during refueling.

9.7.3.12. **Powder-Actuated Tools (PAT).**

9.7.3.12.1. Powder-actuated tools (generically called a Hilti gun or a Ramset gun after their manufacturing companies) operate like a loaded gun and must be treated with extreme caution. In fact, they are so dangerous that they must be operated only by specially trained employees.

9.7.3.12.2. When using PAT, an employee must wear suitable ear, eye, and face protection. The user must select a powder level—high or low velocity—that is appropriate for the powder-actuated tool and necessary to do the work without excessive force.

9.7.3.12.3. The muzzle end of the tool must have a protective shield or guard centered perpendicular to and concentric with the barrel to confine any fragments or particles that are projected when the tool is fired. A tool containing a high-velocity load must be designed not to fire unless it has this kind of safety device.

9.7.3.12.4. To prevent the tool from firing accidentally, two separate motions are required for firing. The first motion is to bring the tool into the firing position, and the second motion is to pull the trigger. The tool must not be able to operate until it is pressed against the work surface with a force of at least 5 pounds (2.2 kg) greater than the total weight of the tool.

9.7.3.12.5. If a PAT misfires, the user must hold the tool in the operating position for at least 30 seconds before trying to fire it again. If it still will not fire, the user must hold the tool in the operating position for another 30 seconds and then carefully remove the load in accordance with the manufacturer's instructions. This procedure will make the faulty cartridge less likely to explode. The bad cartridge should then be put in water immediately after removal. If the tool develops a defect during use, it should be *tagged* and must be *taken out of service immediately* until it is properly repaired.

9.7.3.12.6. Safety precautions that must be followed when using powder actuated tools include the following:

9.7.3.12.6.1. Do not use a tool in an explosive or flammable atmosphere.

9.7.3.12.6.2. Inspect the tool before using it to determine that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions and has the proper shield, guard, and attachments recommended by the manufacturer.

9.7.3.12.6.3. Do not load the tool unless it is to be used immediately.

9.7.3.12.6.4. Do not leave a loaded tool unattended, especially where it would be available to unauthorized persons.

9.7.3.12.6.5. Keep hands clear of the barrel end.

9.7.3.12.6.6. Never point the tool at anyone.

9.7.3.12.7. When using powder-actuated tools to apply fasteners, several additional procedures must be followed:

9.7.3.12.7.1. Do not fire fasteners into material that would allow the fasteners to pass through to the other side.

9.7.3.12.7.2. Do not drive fasteners into very hard or brittle material that might chip or splatter or make the fasteners ricochet.

9.7.3.12.7.3. Always use an alignment guide when shooting fasteners into existing holes.

9.7.3.12.7.4. When using a high-velocity tool, do not drive fasteners more than 3 inches (7.62 centimeters) from an unsupported edge or corner of material such as brick or concrete.

9.7.3.12.7.5. When using a high velocity tool, do not place fasteners in steel any closer than 1/2-inch (1.27 centimeters) from an unsupported corner edge unless a special guard, fixture, or jig is used.

9.7.3.13. **Hydraulic Power Tools.**

9.7.3.13.1. The fluid used in hydraulic power tools must be an approved fire-resistant fluid and must retain its operating characteristics at the most extreme temperatures to which it will be exposed. The exception to fire-resistant fluid involves all hydraulic fluids used for the insulated sections of derrick trucks, aerial lifts, and hydraulic tools that are used on or around energized lines. This hydraulic fluid shall be of the insulating type.

9.7.3.13.2. The manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings must not be exceeded.

9.7.3.13.3. All jacks—including lever and ratchet jacks, screw jacks, and hydraulic jacks—must have a stop indicator, and the stop limit must not be exceeded. Also, the manufacturer's load limit must be permanently marked in a prominent place on the jack, and the load limit must not be exceeded.

9.7.3.13.4. A jack should never be used to support a lifted load. Once the load has been lifted, it must immediately be blocked up. Put a block under the base of the jack when the foundation is not firm, and place a block between the jack cap and load if the cap might slip.

9.7.3.13.5. To set up a jack, make certain of the following:

9.7.3.13.5.1. The base of the jack rests on a firm, level surface;

9.7.3.13.5.2. The jack is correctly centered;

9.7.3.13.5.3. The jack head bears against a level surface; and

9.7.3.13.5.4. The lift force is applied evenly.

9.7.3.13.6. Proper maintenance of jacks is essential for safety. All jacks must be lubricated regularly. In addition, each jack must be inspected according to the following schedule: (1) for jacks used continuously or intermittently at one site—inspected at least once every 6 months, (2) for jacks sent out of the shop for special work—inspected when sent out and inspected when returned, and (3) for jacks subjected to abnormal loads or shock—inspected before use and immediately thereafter.

9.8. Ladder Safety.

9.8.1. **Hazards of Ladders.** Falls are the primary hazard associated with portable ladders. Falls result from unsafe acts and conditions. Hazards are minimized if workers adhere to proper ladder discipline, and if supervisors ensure equipment is inspected, maintained in good condition, and properly used.

9.8.2. **Ladder Selection.**

9.8.2.1. Portable ladders shall meet ANSI design and construction specifications.

9.8.2.2. There are a variety of ladder styles. Select the appropriate ladders based upon construction, size, and where and how the ladder may be used. Ladders are most commonly constructed from wood, metal, and fiberglass.

9.8.2.2.1. Ladders come in four workload ratings. The table below gives the basic differences in these ladders. Supervisors shall order Type IA or I ladders whenever possible. Type II ladders shall only be considered for light duty use within facilities. Class III ladders shall not be used.

Figure 9.3. Ladders Workload Ratings

Ladders Workload Ratings		
Duty Rating	**Ladder Type**	**Working Load (Pounds)**
Extra heavy duty	IA	300
Heavy duty	I	250
Medium duty	II	225
Light duty	III	200

9.8.2.2.2. Metal ladders shall not be used in areas where a worker or the ladder could contact exposed energized electrical circuits.

9.8.2.2.3. Three leg orchard ladders are not approved for use by ITD employees.

9.8.3. **Inspections.** A thorough visual inspections of ladders shall be made prior to being placed in service. Workers shall perform a visual inspection prior to each use. Ladders that are defective will be removed from service and disposed of. Repairing defective ladders is not authorized. Defects or damage to look for include:

9.8.3.1. Evidence of the ladder having been exposed to excessive heat, such as fire or corrosive substances.

9.8.3.2. Side rails, steps, rungs, or related hardware that are cracked, split, or deformed.

9.8.3.3. Pulleys, cables, and ropes which bind or are frayed.

9.8.3.4. Rivets, connections, and spreaders for looseness or shearing.

9.8.3.5. Nonskid base material that is loose or missing. Metal and metal-reinforced single and extension ladders shall be equipped with spurs, spikes, or rubber cleats to prevent slipping.

9.8.3.6. Ladders with conductive side rails that are not marked for electrical hazards. Ladders not already marked with safety use instructions by the manufacturer, or ladders with faded, unreadable manufacturer's instructions, shall have the following stenciled in two-inch high, red letters, or the largest letters the surface will allow (minimum letter size is one inch): ―DANGER— DO NOT USE AROUND ELECTRICAL EQUIPMENT.

9.8.3.7. Ladders with broken or missing steps, rungs or cleats, broken side rails, or other defects.

9.8.4. **Instructions for Ladder Use.**

9.8.4.1. Read and follow all labels/markings on the ladder.

9.8.4.2. Avoid electrical hazards. Look for overhead power lines before handling a ladder. Never use a metal ladder near power lines or exposed energized electrical equipment.

9.8.4.3. Always inspect the ladder prior to using it. If the ladder is damaged, it must be removed from service and tagged until repaired or discarded. See paragraph 9.8.6 below.

9.8.4.4. Always maintain a 3-point contact (two hands and a foot, or two feet and a hand) on the ladder when climbing. Keep your body near the middle of the step and always face the ladder while climbing (see diagram).

9.8.4.5. Only use ladders and appropriate accessories (ladder levelers, jacks, or hooks) for their designed purposes.

9.8.4.6. Ladders must be free of any slippery material on the rungs, steps, or feet.

9.8.4.7. Do not use a self-supporting ladder (e.g. a step ladder) as a single ladder or in a partially closed position.

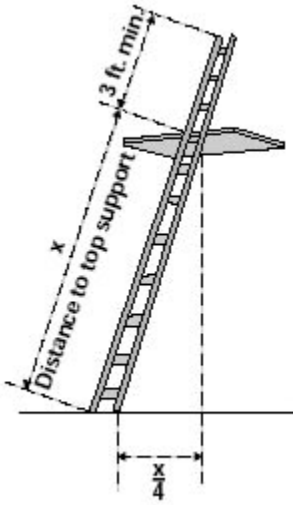
9.8.4.8. Do not use the top step/rung of a ladder as a step/rung unless it was designed for that purpose.

9.8.4.9. Use a ladder only on a stable and level surface, unless it has been secured (top or bottom) to prevent displacement.

9.8.4.10. Do not place a ladder on boxes, barrels, or other unstable bases to obtain additional height.

9.8.4.11. Do not move or shift a ladder while a person or equipment is on the ladder.

9.8.4.12. An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single, or extension ladder.



9.8.4.13. The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface (see diagram).

9.8.4.14. A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement. Or a barricade must be erected to keep traffic away from the ladder.

9.8.4.15. Be sure that all locks on an extension ladder are properly engaged.

9.8.4.16. Do not exceed the maximum load rating of a ladder. Be aware of the ladder's load rating and of the weight it is supporting, including the weight of any tools or equipment.

9.8.5. **Fixed Ladders.** Fixed ladders provide a means of access to bridges, roofs, pits, towers, and other limited-access areas. The following paragraphs provide general design and installation criteria for fixed ladders:

9.8.5.1. Length. Ladders 20 feet or less shall be of a continuous length. When they are more than 20 feet and of continuous length, the following requirements apply:

9.8.5.2. Landing Platforms. A landing platform is provided for a person to rest or gain access to another section of the ladder. Platforms shall be provided every 30 feet or fraction thereof. Where no cage, well or ladder safety device is provided, landing platforms shall be provided for each 20 feet of height or fraction thereof.

9.8.5.3. The platform shall not be less than 24 inches wide by 30 inches long and shall be equipped with standard railings. Toeboards are required where the hazard of objects falling is present. Refer to 29 CFR 1910.27 for additional information.

9.8.5.4. Ladder Safety Devices, Cages, and Wells. Cages and wells merely contain a falling climber rather than restricting the distance of fall. Therefore, new fixed ladders (where fall protection is required) shall include a safety climb device rather than a cage or well. All ladder safety devices such as those that incorporate positioning belts, friction brakes, and sliding attachments shall meet the design requirements of the ladders which they serve. Where a cage is installed, it shall extend a minimum of 42 inches above the top of landing unless other acceptable protection is provided. Cages shall extend down the ladder to a point no less than seven (7) feet, nor more than eight (8) feet, above the base of the ladder. Refer to 29 CFR 1910.27., *Fixed Ladders,* for specific design and construction information. Ladder safety devices, cages, or wells are required on all fixed ladders more than 20 feet.

9.8.6. **Defective Ladders.** Ladders needing repairs are subject to the following rules:

9.8.6.1. Portable ladders with structural defects such as broken or missing rungs, cleats or steps, broken or split rails, corroded components, or other faulty or defective components, must immediately be marked defective or tagged with "Do Not Use", and they must be withdrawn from service and discarded. Portable ladders will not be repaired.

9.8.6.2. Fixed ladders with structural defects such as broken or missing rungs, cleats or steps, broken or split rails, or corroded components, must be withdrawn from service until repaired.

9.8.6.3. Defective fixed ladders are considered withdrawn from use when they are immediately tagged with "Do Not Use" or similar language, or are marked in a manner that identifies them as defective. They are also considered withdrawn from use when they are blocked (e.g. a plywood attachment that spans several rungs).

9.8.6.4. Fixed Ladder repairs must restore the ladder to a condition meeting its original design criteria before the ladder is returned to use.

9.9. Machine Guarding.

9.9.1. **General Requirements.** One or more methods of machine guarding must be used to protect operators and other employees from hazards, including those created by point of operation, in-running nip points, rotating parts, flying chips and sparks. OSHA 29CFR1910.212(a)(1)

9.9.2. **Hazardous Mechanical Motions and Actions.**

9.9.2.1. Identifying hazards is the first step toward protecting workers and promoting safety in the workplace. The basic types of hazardous mechanical motions and actions are:

9.9.2.1.1. **Motion:** Even smooth, slowly rotating shafts can grip clothing, and through mere skin contact, force an arm or hand into a dangerous position.

9.9.2.1.2. **Rotating parts:** Can cause hazards such as in-running nip points. Parts can rotate closely to each other in opposite directions while their axes are parallel to each other. When they run closely, the stock fed between two rolls produces a nip point. This danger is common on machines with intermeshing gears, rolling mills and calendars.

9.9.2.1.2.1. Rotating and tangentially moving parts also cause nip points. Potential hazards include the points of contact between a power transmission belt and its pulley, a chain and its sprocket, or a rack and pinion.

9.9.2.1.2.2. Rotating and fixed parts, including spoked hand wheels on flywheels, screw conveyors and the periphery of an abrasive wheel often create shearing, crushing or abrading actions that also can cause nip points.

9.9.2.1.3. **Reciprocating motions:** Causes a back-and-forth or up-and-down action that can strike a worker or catch a worker between a moving and a stationary part.

9.9.2.1.4. **Transverse motion:** Movement in a straight, continuous line. Moving parts can catch or strike a worker in a pinch point or shear point.

9.9.2.1.5. **Cutting action:** Hazards involve rotating, reciprocating, or transverse motion, where finger, head, and arm injuries can occur, and where flying chips and scrap material can strike a worker's eyes or face. Cutting actions are dangers with band saws, circular saws, and boring or drilling machines.

9.9.2.1.6. **Punching action:** Results when power is applied to a slide (ram) for the purpose of blanking, drawing or stamping metal or other materials. The danger occurs where stock is inserted, held and withdrawn by hand as with power presses.

9.9.2.1.7. **Shearing action:** Involves applying power to a shear or knife to trim or shear materials such as metal. The danger is where stock is inserted, held and withdrawn, as with hydraulically or pneumatically powered shears.

9.9.2.1.8. **Bending action:** Results when power is applied to a slide to draw or stamp metal or other material. This is a threat where stock is inserted, held and withdrawn, as with equipment such as power presses.

9.9.3. **Safeguards Requirements.**

9.9.3.1. Machine Safeguards must meet the following minimum general requirements:

9.9.3.1.1. Prevent contact. The safeguard must prevent hands, arms, or any other part of a worker's body from making contact with dangerous moving parts.

9.9.3.1.2. Be secure. Workers should not be able to easily remove or tamper with the safeguard. Guards and safety devices should be made of durable materials that will

withstand normal use. They must be firmly secured to the machine where possible or secured elsewhere if attachment to the machine is not possible.

9.9.3.1.3. Protect from falling objects. The safeguard should ensure that no objects can fall into moving parts.

9.9.3.1.4. Create no new hazards. A safeguard defeats its own purpose if it creates a hazard such as a shear point, a jagged edge or an unfinished surface.

9.9.3.1.5. Create no interference. Any safeguard that impedes a worker from performing a job quickly and comfortably might soon be bypassed or disregarded. Proper safeguarding can actually enhance efficiency because it relieves a worker's injury apprehensions.

9.9.3.1.6. Allow safe lubrication. If possible, one should be able to lubricate the machine without removing the safeguard. Locating oil reservoirs outside the guard, with a line leading to the lubrication point, will reduce the need for the operator or maintenance worker to enter the hazardous area.

9.9.4. Types of Safeguarding.

9.9.4.1. The type of operation, size or shape of stock, method of handling, physical layout of the work area, type of material, and production requirements or limitations will help you determine the best method for safeguarding.

9.9.4.2. As a general rule, fixed guards that enclose the danger area best to protect power transmission apparatuses. However, there are several options for point-of-operation hazards that have moving parts. Choose the most effective and practical option.

9.9.4.3. Safeguards can be grouped under five general classifications: guards, devices, safety controls, gates and location/distance.

9.9.4.4. **Guards.**

9.9.4.4.1. Fixed guards are permanent parts of a machine. These guards are preferable because they're simple and permanent.

9.9.4.4.2. Interlocked guards automatically shut off or disengage a machine through a tripping mechanism or power when the guard is opened or removed. The machine cannot cycle or start until the guard is replaced.

9.9.4.4.3. Adjustable guards are useful because they accommodate various sizes of stock.

9.9.4.4.4. Self-adjusting guards allow the opening of the barrier to be determined by the stock. As the operator moves the stock into the danger area, the guard is pushed away, providing an opening that only is large enough for the stock.

9.9.4.5. **Devices.**

9.9.4.5.1. Presence-sensing devices are divided into two groups. Photoelectrical devices use light sources and controls that can interrupt the machine. Radio frequency or capacitance devices use a radio beam that is part of the machine circuit. When the capacitance field is broken, the machine will stop.

9.9.4.5.2. Electromechanical sensing devices have a probe or contact bar that descends to a predetermined distance when the operator initiates the machine cycle. If there is an obstruction preventing it from descending to its full, predetermined distance, the control circuit does not start the machine.

9.9.4.5.3. Pullback devices use cables attached to the operator's hands, wrists and/or arms. They primarily are used on machines with striking-action hazards. When the slide/ram is up, the operator is allowed access to the points of operation. When the slide/ram descends, a mechanical link automatically assures that the operator's hands move away from the points of operation.

9.9.4.5.4. Restraint devices allow the operator's hands to travel only in a predetermined safe area.

9.9.4.6. **Safety Controls.**

9.9.4.6.1. Safety trip controls, such as pressure-sensitive body bars, safety tripods and safety tripwire cables, can quickly deactivate a machine.

9.9.4.6.2. Two-hand controls require both hands and constant pressure on the controls for the machine to operate.

9.9.4.7. **Gates.**

9.9.4.7.1. Gates are movable barriers that protect the operator at the point of operation before the machine cycle starts.

9.9.4.8. **Location/Distance.**

9.9.4.8.1. Though not actual guards, location and distance can keep employees safe. When possible, place a machine in an infrequently traveled area or where it's dangerous moving parts are not accessible. A thorough hazard analysis of each machine and particular situation is essential before using this safeguarding technique.

9.9.4.9. **Guard Construction.**

9.9.4.9.1. Guards designed and installed by the machine producer are desirable because they conform to the design and function of the machine, and they can be designed to strengthen the machine or to serve some additional functional purpose.

9.9.4.9.2. User-built guards are sometimes necessary, with older machines, they are often the only practical solution. They also might be the only choice for mechanical

power transmission apparatuses in older facilities. User-built guards can be designed and built to fit unique and changing situations and can be installed on individual dies and feeding mechanisms.

9.9.4.10. **Guard Materials.**

9.9.4.10.1. In many circumstances, metal is the best material for guards. It might also be feasible to use plastic where higher machine visibility is required. Guards made of wood are generally not recommended because of their flammability and lack of durability and strength.

9.9.4.10.2. However, wood guards can be options in woodworking and chemicals industries, and in industries where vapors or gases or where manufacturing conditions would deteriorate of metal guards. Wood guards also may be used in construction work and in outdoor locations where extreme cold make metal guards undesirable. In all other industries, wood guards are not allowed. Ref: OSHA 29CFR 1910.219 (o) (2).

9.10. Crane, Hoist, and Sling Safety Program.

9.10.1. **Introduction.** Cranes, hoists, and slings pose a serious safety hazard if not used properly. It is the policy of the Idaho Transportation Department (ITD) to ensure employees are trained on the hazards of using cranes, hoists, and slings, and also to ensure that such equipment is safely maintained.

9.10.2. **Purpose.** This program has been established to:

9.10.2.1. Ensure the safe use of cranes, hoists, and slings.

9.10.2.2. Ensure that work units understand and comply with safety standards related to cranes, hoists, and slings.

9.10.2.3. Assign responsibilities to personnel which are necessary for successful implementation of this program.

9.10.3. **Scope & Applicability.**

9.10.3.1. This program applies to all employees at all ITD locations.

9.10.3.2. This program covers the following cranes and hoists used by ITD employees: overhead and gantry cranes, semi-gantry cranes, cantilever gantry cranes, wall cranes, monorail cranes, bridge cranes, single girder cranes, overhead hoists, and other hoists and cranes having the same fundamental characteristics (See Appendix C for examples).

9.10.3.3. This program does not cover mobile cranes (wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes), engine hoists or winches (See Appendix C for examples).

9.10.3.4. The program covers the following types of slings used by ITD employees: alloy steel chain, wire rope, metal mesh, natural and synthetic fiber rope, and synthetic webbing (See Appendix D for examples).

9.10.4. **References.** The following have been used as references in the development of this program:

9.10.4.1. OSHA Publication – Sling Safety - #3072

9.10.4.2. OSHA Standard – Overhead and Gantry Cranes – 29 CFR 1910.179

9.10.4.3. OSHA Standard – Slings – 29 CFR 1910.184

9.10.4.4. ANSI/ASME B30.9 – Slings

9.10.4.5. ANSI/ASME B30.10 - Hooks

9.10.4.6. ANSI/ASME B30.11 – Monorails and Underhung Cranes

9.10.4.7. ANSI/ASME B30.16 – Overhead Hoists (Underhung)

9.10.4.8. ANSI/ASME B30.17 – Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)

9.10.4.9. HMI (Hoist Manufacturers Institute) – Manually Lever Operated Hoist Inspection and Hoist Maintenance Personnel Manual

9.10.5. Responsibilities.

9.10.5.1. **District Engineers/Division Administrators:**

9.10.5.1.1. Ensure that responsibilities assigned within this program are carried out within their administrative work unit.

9.10.5.1.2. Designate individuals responsible for the implementation of this program within their work unit.

9.10.5.1.3. Actively support this program as part of the work unit's overall safety effort.

9.10.5.1.4. Ensure adequate funding is available to support this program.

9.10.5.2. **Office of Employee Safety & Risk Management (ESRM):**

9.10.5.2.1. Assist work units in implementing the provisions of this program.

9.10.5.2.2. Periodically review and update this written program.

9.10.5.2.3. Periodically evaluate the overall effectiveness of this program.

9.10.5.3. **District Safety Compliance Officers (SCO):**

9.10.5.3.1. Coordinate implementation of this program within their work unit.

9.10.5.3.2. Be knowledgeable of components of program and ensure program compliance.

9.10.5.3.3. Assist in the investigation of serious accidents related to cranes, etc.

9.10.5.3.4. Actively support this program as part of the work unit's overall safety effort.

9.10.5.4. **Supervisors:**

9.10.5.4.1. Determine the applicability of this program to activities conducted within their work unit.

9.10.5.4.2. Be thoroughly informed of the contents of this program and its application to their areas of responsibility and authority.

9.10.5.4.3. Ensure employees comply with all provisions of this program.

9.10.5.4.4. Ensure employees receive training appropriate to their assigned tasks and maintain documentation of such training.

9.10.5.4.5. Ensure employees are provided with and use appropriate protective equipment.

9.10.5.4.6. Take prompt corrective action when unsafe conditions or practices are observed.

9.10.5.4.7. Investigate injuries and incidents within their work unit related to crane, hoist and sling usage.

9.10.5.5. **Employees:**

9.10.5.5.1. Follow the work practices described in this program, including the use of appropriate protective equipment.

9.10.5.5.2. Attend all training required by this program.

9.10.5.5.3. Immediately report any unsafe conditions or concerns related to cranes, hoists or slings to their supervisor.

9.10.6. **Definitions.**

- **Authorized Person (Repair):** Someone with training and experience pertaining to crane and hoist repair. There are specific safety considerations that are unique to cranes and hoists, thus the person must have training and experience in crane and hoist repair.
- **Bridge:** Part of a crane consisting of girders, trucks, end ties, foot walks, and drive mechanism which carries the trolley or trolleys.
- **Bridge Crane:** A load lifting system consisting of a hoist which moves laterally on a beam, girder, or bridge which in turn moves longitudinally on a runway made of

beams and rails. Loads can be moved to any point within a rectangle formed by the bridge span and runway length.

- **Bumper:** A device for reducing impact when a moving crane or trolley reaches the end of its permitted travel, or when two moving cranes or trolleys come into contact. This device may be attached to the bridge, trolley, or runway stop.
- **Competent Trainer:** A contractor, training or equipment vendor who has experience training crane/hoist operation and is familiar with the equipment is the preferred Competent Trainer.
- **Competent Evaluator:** An employee in the department/work unit who is experienced and competent with the crane. An employee must be familiar with the equipment and its safe operation. In order to be considered competent in regards to conducting the evaluation portion of the crane training, an employee must have successfully completed the classroom portion of crane/hoist training. This employee could be but is not limited to a certified operator, supervisor/manager or safety officer.
- **Crane:** A machine for lifting and lowering a load and moving it horizontally with the hoisting mechanism as an integral part of the machine. Cranes can be driven manually or by power.
- **Drum:** The cylindrical member around which rope is wound for lifting or lowering the load.
- **Designated Person (Monthly Inspections):** Selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.
- **End Truck:** An assembly consisting of the frame and wheels which support the crane girder(s) and allow movement along the runway.
- **Floor Operated Crane:** A crane controlled by an operator on the floor or an independent platform using a pendant or non-conductive rope.
- **Gantry Crane:** A crane that has a hoist in a trolley which runs horizontally along gantry rails, usually fitted underneath a beam spanning between uprights which themselves have wheels so that the whole crane can move at right angles to the direction of the gantry rails.
- **Hoist:** A suspended machinery unit that is used for lifting or lowering a freely suspended (unguided) load.
- **Limit Device:** A device that is operated by some part or motion of a power-driven hoist to limit motion.
- **Monorail:** A trolley suspension crane hoist, whose trolley is suspended from a single rail. This type of crane hoist is used to move a load horizontally.
- **Overhead Crane:** A crane with a movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.
- **Reeving:** A system in which a rope or chain travels around drums, sheaves, or sprockets.

- **Rope:** Refers to wire rope unless otherwise specified.
- **Sheave:** A grooved wheel or pulley used with a rope or chain to change direction and point of application of a pulling force.
- **Trolley:** the unit which travels on the bridge rails and carries the hoisting mechanism.
- **Wall Mounted Jib Crane:** A crane with a jib and with or without a trolley. The wall crane is supported from a side wall or columns of a building.

9.10.7. **General Requirements for Cranes, Hoists, and Slings.**

9.10.7.1. The work unit must notify the District SCO or ESRM when a crane or hoist is installed. This is required so that the unit can be added to the monthly and annual inspection schedule.

9.10.7.2. Only trained employees (effective June 30, 2022) shall operate a crane or hoist.

9.10.7.3. Cranes and hoists shall go through a pre-use, monthly, and annual inspection.

9.10.7.4. Slings shall go through pre-use and annual inspections.

9.10.7.5. Any unsafe condition noted during an inspection shall be corrected before the equipment is used.

9.10.7.6. Operators shall comply with the manufacturer's specifications and limitations applicable to the operation of the equipment.

9.10.7.6.1. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer competent in this field. Such determinations will be appropriately documented and recorded.

9.10.7.7. Operators shall follow safe work practices when operating a cranes, hoists, and slings. Refer to **section 9.10.11.5**. in this Safety Manual

9.10.8. **Training.**

9.10.8.1. Training must be completed prior to any use of a crane or hoist. Training of crane and hoist operators at ITD is a two-step process for the majority of cranes/hoists, which consists of classroom instruction and hands-on training.

9.10.8.1.1. In additional to the above requirements, a documented operator evaluation is required for operators of Bridge Cranes (Appendix G).

9.10.8.2. Classroom instruction, hands-on training, and operator evaluations can be conducted by the equipment manufacturer, a safety consultant, and/or a vendor who specializes in crane/hoist training.

9.10.8.3. Training must be specific to the type of equipment being used.

9.10.8.3.1. Training shall include the following:

9.10.8.3.1.1. Characteristics of safe crane and hoist operation.

9.10.8.3.1.2. Inspection procedures.

9.10.8.3.1.3. Basic load handling considerations.

9.10.8.3.1.4. Operator responsibilities.

9.10.8.3.1.5. Communication used during crane and hoist operation.

9.10.8.3.1.6. Hands-on equipment training.

9.10.8.4. Trainees must successfully complete hands-on training before being allowed to operate the equipment independently. Trainees will be given adequate supervision and time to learn basic operating skills.

9.10.8.5. Refresher training in relevant topics will be provided to a crane or hoist operator when any of the following occur:

9.10.8.5.1. The operator has been observed to be using the equipment in an unsafe manner.

9.10.8.5.2. The operator has been involved in an accident or a near-miss incident.

9.10.8.5.3. The operator is assigned to operate a different type of equipment.

9.10.8.5.4. A condition in the workplace changes in a manner that could affect safe operation of the equipment.

9.10.9. **Inspections for Cranes, Hoists, and Slings.** Each work unit is responsible for ensuring inspections are conducted at the following frequencies:

9.10.9.1. **Pre-use Inspection** – (See Appendix A).

9.10.9.1.1. Prior to use the operator shall visually inspect the crane, hoist, and/or slings for defects.

9.10.9.1.2. The pre-use inspection will identify conditions that could affect the safe use of the equipment.

9.10.9.1.3. Operators must immediately report any unsafe crane conditions to their supervisor. The supervisor is then responsible for ensuring the necessary arrangements are made for repair.

9.10.9.1.4. Only authorized personnel shall perform repairs and adjustments.

9.10.9.1.4.1. All replacement parts shall be the same design as the original or an equivalent design as designated by the manufacturer.

9.10.9.2. Monthly Inspection (Crane and Hoists) – (See Appendix A & B).

9.10.9.2.1. A documented monthly inspection of all cranes and hoists shall be performed. These inspections must be performed by a designated person. The

designated person must be a trained crane/hoist operator who has gone through monthly crane/hoist inspection training.

9.10.9.3. **Annual Inspection (Cranes and Hoists).**

9.10.9.3.1. A documented annual inspection of all cranes and hoists shall be performed by a third party.

9.10.9.3.2. All cranes and hoists shall be labeled or marked to show date of last annual inspection.

9.10.9.4. **Annual Inspection (Slings).**

9.10.9.4.1. A documented annual inspection of all slings shall be performed by a third party who has gone through sling inspection training.

9.10.9.5. If any unsafe conditions exist, the equipment shall be removed from service. In order to remove a crane or hoist from service it shall be locked out and tagged out to prevent use.

9.10.9.6. **Cranes and Hoists Not In Regular Use.**

9.10.9.6.1. A unit which has been idle for a period of one month or more shall be given a monthly inspection before placing in service.

9.10.9.7. Prior to initial use all new, altered, modified, or repaired cranes and hoists shall have the following testing performed by the installation company or third party:

9.10.9.7.1. Hoisting and lowering.

9.10.9.7.2. Trolley travel.

9.10.9.7.3. Bridge travel.

9.10.9.7.4. Limit switches, locking and safety devices.

9.10.9.7.5. **Load Tests.**

9.10.9.7.5.1. Shall not be more than 125% of the rated load unless otherwise recommended by the manufacturer.

9.10.10. **Maintenance.** Preventive maintenance shall be performed as prescribed by the manufacturer as detailed in the owner's manual.

9.10.11. **Safe Work Practices of Cranes, Hoists, and Slings Cranes.**

9.10.11.1. General.

9.10.11.1.1. A personal protective equipment (PPE) hazard assessment must be performed for the task. Required PPE includes a hardhat and safety toe shoes. Safety Glasses and gloves may also be required.

9.10.11.1.2. Rated load capacities, recommended operating speeds, special hazard warnings, and/or instructions shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to operators while they are at their control stations.

9.10.11.1.3. Do not exceed the rated load capacity of the crane, hoist, slings, or other components. (Keep in mind that the hoist may be higher rated that the rail/beam or vice versa)

9.10.11.1.4. Persons operating the crane, hoist, or sling shall inspect all machinery and equipment prior to each use to make sure it is in safe operating condition. (See Appendix A)

9.10.11.1.5. Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, moving equipment shall be guarded if they're exposed to contact by employees or create a hazard.

9.10.11.1.6. No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

9.10.11.1.7. Disconnect power to a hoist or crane that is unsafe or in need of repair. Arrange to have the equipment locked out and tagged out.

9.10.11.1.8. Never operate a hoist or crane that, in your opinion, is UNSAFE TO OPERATE.

9.10.11.2. **Engaging the Load.**

9.10.11.2.1. The sling or other device shall be properly seated and secured in the base of the hook.

9.10.11.2.2. The load shall not be applied to the point of the hook or the hook latch.

9.10.11.2.3. Before moving the load, the operator shall be sure chains and wire rope are not kinked or twisted, and that multiple part chains or ropes are not twisted about each other.

9.10.11.2.4. The rope or chain must be properly seated on the drum, sheaves, or sprockets before the lift takes place.

9.10.11.2.5. Remove slack from the sling, chain, or cable before lifting a load.

9.10.11.2.6. The hoist must be centered over the load.

9.10.11.2.7. The operator shall not pick up a load in excess of the rated load of the hoist or crane.

9.10.11.2.8. Specific attention should be given to balancing of the load to prevent slipping.

9.10.11.3. **Moving the Load.**

9.10.11.3.1. The operator shall not engage in any activity that will divert his or her attention from the task.

9.10.11.3.2. The operator shall respond to signals from a designated person only. However, the operator shall obey a stop signal at all times, no matter who gives it.

9.10.11.3.3. The operator shall make sure the load and hoist will clear all obstacles before moving or rotating the load.

9.10.11.3.4. A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

9.10.11.3.5. The operator shall inch powered hoists and cranes slowly in engagement with a load, but they should avoid unnecessary inching and quick reversals of direction.

9.10.11.3.6. A load shall not be lifted more than a few inches until it is well balanced in the sling or lifting device.

9.10.11.3.7. When lifting loads at or near capacity, brake action shall be tested by lifting the load a few inches off the surface to verify that the brakes are holding.

9.10.11.3.8. On rope hoists, the load shall not be lowered below the point where less than two wraps of rope remain on each anchorage of the hoist drum, unless a lower limit device is provided. In this case no less than one wrap may remain on each anchorage of the hoist drum.

9.10.11.3.9. Loads shall not be suspended over personnel.

9.10.11.3.10. All employees shall be kept clear of loads about to be lifted and of suspended loads.

9.10.11.3.11. Under no circumstances may anyone ride the hook or load.

9.10.11.3.12. Directional movement should be made smoothly and deliberately to avoid swing.

9.10.11.3.13. Never pull a hoist by the controller cable.

9.10.11.3.14. Contact between trolleys (on two trolley cranes) or between trolleys and stops should be avoided.

9.10.11.3.15. The operator shall not use the upper (or lower, if provided) limit device(s) as a normal means of stopping the hoist. These are emergency devices only.

9.10.11.4. **Placing the Load.**

9.10.11.4.1. Never leave the controls unattended while a load is suspended. If it becomes necessary to leave the controls, lower the load to the floor.

9.10.11.4.2. The load block should be positioned above head level when the hoist is not in use.

9.10.11.4.3. Care shall be exercised when removing a sling from under a landed and blocked load.

9.10.11.5. **Slings.**

9.10.11.5.1. Slings shall be inspected prior to each use to make sure they are in safe operating condition (See Appendix A).

9.10.11.5.2. Slings that are damaged or defective shall not be used.

9.10.11.5.3. Slings shall not be shortened with knots or bolts or other makeshift devices.

9.10.11.5.4. Sling legs shall not be loaded in excess of their rated capacities.

9.10.11.5.5. Slings used in a basket hitch shall have the loads balanced to prevent slippage.

9.10.11.5.6. Slings shall be securely attached to their loads.

9.10.11.5.7. Slings shall be padded or protected from sharp edges of their loads.

9.10.11.5.8. Suspended loads shall be kept clear of all obstructions.

9.10.11.5.9. Hands and fingers shall not be placed between the sling and its load while the sling is being tightened around the load.

9.10.11.5.10. Shock loading is prohibited (abrupt starting or stopping of the load).

9.10.11.5.11. A sling shall not be pulled from under a load when the load is resting on the sling.

9.10.11.5.12. Slings shall be properly stored when not in use so they are not subject to mechanical damage, moisture, corrosives, extreme temperature, or kinking.

9.10.12. **Recordkeeping.**

9.10.12.1. Each work unit is responsible for maintaining the following records in order to meet the requirements of this program:

9.10.12.1.1. A listing of all cranes and hoists.

9.10.12.1.2. Monthly inspections, annual inspections, repair records, and load tests according to the frequencies detailed in **section 9.10.9**.

9.10.12.2. The District SCO or ESRM is responsible for maintaining the following records in order to meet the requirements of this program:

9.10.12.2.1. Copies of all monthly inspection records for one year after completion.

9.10.12.2.2. Copies of annual inspection records for at least four years.

9.10.12.2.3. Copies of repair records for the life of the equipment.

9.10.12.2.4. Copies of load test results for the life of the equipment.

9.10.12.3. Training & Development is responsible for maintaining the following records in order to meet the requirements of this program:

9.10.12.3.1. A record of training which includes: (Use Appendix E or equivalent)

9.10.12.3.2. Name of trainer.

9.10.12.3.3. Name of operator.

9.10.12.3.4. Date of training (classroom, hands-on training, hands-on evaluation).

9.10.12.3.5. Training & Development will retain training records for training they have provided indefinitely.

9.10.12.4. Contractors are required to follow all applicable OSHA regulations and manufacturer's instructions. Contractors are not permitted to use any crane, hoist, or sling owned by ITD without written approval from the ESRM.

Appendix A

Pre-Use Crane, Hoist and Sling Inspection Guidelines

Item (Cranes and Hoists)	Yes	No	N/A
Load rating marked on each side of the crane.			
Load rating of the hoist marked on the hoist or its load block and legible from the ground? (If the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its loading block and this marking shall be clearly legible from the ground.)			
At least 3 inches of overhead clearance and 2 inches laterally between crane and obstructions.			
All controller functions labeled and legible.			
All operational controls and functional operating mechanisms working properly, properly adjusted and no unusual sounds.			
Upper limit switch operating properly. It shall be tested with no load on the hook. Extreme care shall be exercised; the block shall be "inched" into the limit device or run in at slow speed.			
Excessive wear of components on any functional operating mechanisms.			
Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of the air or hydraulic system.			
Excessive dirt, grease, or foreign matter.			
Deformation and/or cracking of the hook, load block, drums and/or sheaves.			
Safety latch on crane/hoist load block that automatically closes.			

Appendix A

Pre-Use Crane, Hoist and Sling Inspection Guidelines

Item (Slings)	Yes	No	N/A
Chain Slings:			
Nicks, cracks, breaks, stretches, distortions, twists, gouges, bends, heat damage, discoloration, worn or damaged links and components,			
Lack of ability of the chain or components to hinge (articulate) freely,			
Pitting, corrosion or weld splatter,			
Missing or illegible sling identifications,			
Other conditions that cause doubt as to the continued safe use of the sling.			
Wire Rope Slings:			
Broken wires,			
Pitting or corrosion,			
Localized wear (shiny worn spots), abrasion or scrapes,			
Damage or displacement of end fittings, hooks, rings, links, or collars,			
Distortions, kinks, bird caging, crushing, or other evidence of damage to wire rope structure,			
Missing or illegible sling identifications,			
Other conditions that cause doubt as to the continued safe use of the sling.			
Synthetic Fiber Rope / Synthetic Webbing Slings:			
Melting, charring or burning of any part of the surface,			
Snags, punctures, tears, cuts, fraying, broken or worn stitches,			
Change in diameter,			
Discoloration,			
Hard or stiff areas,			
Wear or elongation exceeding the amount recommended by the manufacturer,			
Distortion of fittings,			
Missing or illegible sling identifications,			
Other conditions that cause doubt as to the continued safe use of the sling.			
Metal Mesh Slings:			
Broken weld or brazed joints,			
Broken wire in any part of the mesh,			
Abrasion, corrosion, distortion, pitting, twisting, bending, cracking, gouging of any component,			
Lack of flexibility,			
Missing or illegible sling identifications,			
Other conditions that cause doubt as to the continued safe use of the sling.			

Appendix B

Crane & Hoist Monthly Inspection Checklist

#	Inspection Item	Yes	No	N/A
1	Conduct pre-use inspection of equipment. Does it pass the pre-use inspection? (See Appendix A)			
2	Any deformed, cracked, or corroded members?			
3	Are there worn, cracked, or distorted parts such as pins, bearings, wheels, shafts, gears, rollers, locking and clamping devices, bumpers, and stops?			
4	Is there excessive wear or improper operation of the brake system parts, linings, pawls, chain sprockets or ratchets?			
5	Any cracked or worn sheaves and drums?			
6	Are there loose or missing bolts, nuts, pins or rivets?			
7	Is there any signs of pitting or deterioration of controllers, master switches, contacts, limit switches, and push button stations?			
8	Are load, wind, and other indicators properly operating?			
9	Are gasoline, diesel, electric, or other power plants performing properly?			
10	Are stops provided at the limit of travel of the trolley?			
11	Corroded, cracked, bent, worn, or improperly applied end connections?			
12	Load chain reeving for compliance with hoist manufacturer's recommendation?			
	Hook			
13	Is there any gouges, nicks, weld spatter, corrosion, deformation, cracks?			
14	Has the hook throat opening increased 5%, not to exceed ¼ inch (6 mm), more than the normal throat opening measured at the narrowest point?			

15	Is there any bend or twist from the plane of the unbent hook?			
	Chain			
16	Is there excessive drive chain stretch?			
17	Test the hoist under load in lifting and lowering directions and observe the operation of the chain and sprockets. Does the chain feed smoothly into and away from the sprockets?			
18	Does the chain bind, jump, or is noisy? If so, clean chain. If trouble continues inspect the chain and mating parts for wear, distortion, or other damage.			
19	Slacken the chain and move the adjacent links to one side to inspect for wear at the contact points. Is wear observed? Is stretching suspected?			
Refer to owner's manual for any additional inspection items: **Comments:**				

Crane ID number or identifier:_____

Inspector (print):_____

Sign:_____

Date:_____

Appendix C

Bridge Crane Operator Evaluation Form

Trainee Name:	**Work Unit:**
Evaluator Name:	**Department:**
Crane location:	**Date:**

NOTE: Operators must be evaluated on each type of bridge crane.

Step	Evaluation	N/A	Pass	Fail
1. Pre-use equipment inspection	Did operator utilize appendix A of this document (Pre-Use Hoist, Crane and Sling Inspection Guidelines)? If not, was the operator able to explain all of the items they were looking for? Was the owner's manual referenced for any additional items to be checked?			
2. Load inspection	Was the weight of the load identified as not to exceed the rated capacity?			
	Was load properly secured, balanced and stable?			
3. Move plan	Was a destination identified?			
4. Control operation	Was operator familiar with all controls?			
	Was load speed and control satisfactory? (no sudden stops or acceleration)			
5. Worksite Inspection	Was operator aware of activities in the vicinity including personnel and equipment?			
6. Post move	Was hoist/crane properly stowed? (Hook near bottom of the hoist)			
	Were slings properly stored? (not subject to mechanical damage, moisture, corrosives, extreme temp., or kinking)			
7. Comments	*Must be included for all "Failed" tasks. If task is failed the evaluator must explain what was done incorrectly and have the trainee repeat the task until it is completed correctly.*			
***Trainee Signature*:**				
***Evaluator Signature*:**				

Appendix D

Instructions for Conducting Bridge Crane Operator Evaluations

(Note: The evaluation can be done in-house using an experienced and competent PSU employee or an outside vendor/safety consultant may be used.)

1. Pre-Requisites:
    a. Completed the classroom portion of a crane / hoist training class.
    b. Review and become familiar with the PSU Crane, Hoist and Sling written program.
    c. Be experienced with the equipment you will be training on.
    d. Review owner's manual.

2. Make sure the equipment is in safe condition.

3. Make sure the location is safe.

4. Have operator perform each item on the Bridge Crane Operator Evaluation Form. (Appendix G)

5. Assess the operator's performance. (Appendix G)

6. Explain any "failed" tasks and have operator repeat task.

7. Sign form.

8. File form with designated person. (Supervisor, District SCO, ESRM, etc.)

9.11. Walking and Working Surfaces

9.11.1 General Information:

Walking-Working Surfaces and PPE (Fall Protection Systems) standards on slip, trip and fall hazards are covered in 29CFR1910 (Subpart D), and (Subpart I) requirements for personal fall protection system. This applies to all ITD general industry workplaces and covers all walking-working surfaces, which include horizontal and vertical surfaces such as floors, stairs, roofs, fixed ladders, ramps, scaffolds, elevated walkways and fall protection systems.

9.11.1.1 Specifics for Personal Fall Protection Systems (PFAS) are covered in Chapter 10.5 of this Safety Manual

9.11.1.2. Specifics for use of Portable Ladders are covered in **section 9.8.** of this Safety Manual.

9.11.2. Terms and Definitions

- **Anchorage** means a secure point of attachment for equipment such as lifelines, lanyards, deceleration devices, and rope descent systems. See OSHA 1910.140(c)(10) for more information on anchor points
- **Authorized** means an employee who the employer assigns to perform a specific type of duty, or allows in a specific location or area.
- **Cage** means an enclosure mounted on the side rails of a fixed ladder or fastened to a structure behind the fixed ladder that is designed to surround the climbing space of the ladder. A cage also is called a "cage guard" or "basket guard."
- **Fall hazard** means any condition on a walking-working surface that exposes an employee to a risk of harm from a fall on the same level or to a lower level.
- **Fall protection** means any equipment, device, or system that prevents an employee from falling from an elevation or mitigates the effect of such a fall.
- **Fixed ladder** means a ladder with rails or individual rungs that is permanently attached to a structure, building, or equipment. Fixed ladders include individual rung ladders, but not ship stairs, step bolts, or manhole steps.
- **Grab bar** means an individual horizontal or vertical handhold installed to provide access above the height of the ladder.
- **Guardrail system** means a barrier erected along an unprotected or exposed side, edge, or other area of a walking working surface to prevent employees from falling to a lower level.
- **Handrail** means a rail used to provide employees with a handhold for support.
- **Ladder** means a device with rungs, steps, or cleats used to gain access to a different elevation.
- **Ladder safety system** means a system designed to eliminate or reduce the possibility of falling from a ladder. A ladder safety system usually consists of a carrier, safety

sleeve, lanyard, connectors, and body harness. Cages and wells are not ladder safety systems

- **Maximum intended load** means the total load (weight and force) of all employees, equipment, vehicles, tools, materials, and other loads the employer reasonably anticipates to be applied to a walking-working surface at any one time.
- **Personal fall arrest system** means a system used to slow and stop an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.
- **Personal fall protection system** means a system (including all components) an employer uses to provide protection from falling or to safely slow and stop an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.
- **Platform** means a walking-working surface that is elevated above the surrounding area.
- **Positioning system** (work-positioning system) means a system of equipment and connectors that, when used with a body harness or body belt, allows an employee to be supported on an elevated vertical surface, such as a wall or window sill, and work with both hands free. Positioning systems also are called "positioning system devices" and "work-positioning equipment."
- **Qualified** describes a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project also are called "positioning system devices" and "work-positioning equipment."
- **Stair rail or stair rail system** means a barrier erected along the exposed or open side of stairways to prevent employees from falling to a lower level.
- **Stairway** (stairs) means risers and treads that connect one level with another, and includes any landings and platforms in between those levels.
- **Standard stairs** means a fixed or permanently installed stairway.
- **Through ladder** means a type of fixed ladder that allows the employee to step through the side rails at the top of the ladder to reach a walking-working surface, such as a landing.
- **Travel restraint system** means a combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface.

- **Unprotected sides and edges** mean any side or edge of a walking-working surface (except at entrances and other points of access) where there is no wall, guardrail system, or stair rail system to protect an employee from falling to a lower level.
- **Walking-working surface** means any horizontal or vertical surface on or through which an employee walks, works, or gains access to a work area or workplace location.
- **Warning line** means a barrier erected to warn employees that they are approaching an unprotected side or edge, and which designates an area in which work may take place without the use of other means of fall protection.

9.11.3. Mobile Ladder Platforms:

- Mobile ladder stands, platforms, wheels and casters under load must support 4 times maximum intended load, plus proportional share of unit's weight
- Meet specified design criteria, including slip-resistant surfaces
- Stands and platforms with wheels or casters must have system to impede horizontal movement when occupied, and may not be moved when EE is on it
- All ladder stand platforms with platform height above 10-feet must have guardrails and toeboards on exposed sides and ends of platform
- Removable gates or non-rigid members, such as chains, may be used on mobile ladder stand platforms instead of handrails/guardrails in special-use applications

9.11.4. Standard Stairs

- Vertical clearance above any stair tread to any overhead obstruction is at least 6 feet, 8 inches, at least 6 feet, 6 inches on spiral stair cases.
- Uniform riser heights and tread depths between landings;
- Stairway landings and platforms are at least the width of the stair and at least 30 inches in depth, as measured in the direction of travel.
- When a door or a gate opens directly on a stairway, a platform is provided, and the swing of the door or gate does not reduce the platform's effective usable depth to less than 22 inches.
- Can support at least five times the normal anticipated live load, but never less than a concentrated load of 1,000 pounds applied at any point.
- Standard stairs are used to provide access from one walking-working surface to another when operations necessitate regular and routine travel between levels, including access to operating platforms for equipment.
- Installed at angles between 30 to 50 degrees from the horizontal;
- Maximum riser height of 9.5 inches;
- Minimum tread depth of 9.5 inches;
- Have a minimum width of 22 inches between vertical barriers.

9.11.5. Protection From Fall Hazard

- The employer must ensure each employee on a runway or similar walkway is protected from falling 4 feet or more to a lower level by a guardrail system.
- When an employer can demonstrate that it is not feasible to have guardrails on both sides of a runway used exclusively for a special purpose, the employer may omit the guardrail on one side of the runway provided;
- The runway is at least 18 inches wide and;
- Each employee is provided with and uses a personal fall arrest system or travel restraint system.

9.11.6. Wall Opening

- Each employee on a walking-working surface near an opening, including one with a chute attached, where the inside bottom edge of the opening is less than 39 inches above that walking-working surface and the outside bottom edge of the opening is 4 feet or more above a lower level is protected from falling by the use of guardrail system, safety net system, travel restraint systems, or personal fall arrest systems.

9.11.7. Guardrail System – Standard Railing

The employer must ensure guardrail systems meet the following requirements:

- The top edge height of top rails, or equivalent guardrail system members, are 42 inches, plus or minus 3 inches, above the walking-working surface.
- Midrails are installed at a height midway between the top edge of the guardrail system and the walking-working surface;
- Screens and mesh extend from the walking-working surface to the top rail and along the entire opening between top rail supports;
- Intermediate vertical members (such as balusters) are installed no more than 19 inches apart; and
- Other equivalent intermediate members (such as additional midrails and architectural panels) are installed so that the openings are not more than 19 inches wide.
- Guardrail systems are capable of withstanding, without failure, a force of at least 200 pounds applied in a downward or outward direction within 2 inches of the top edge, at any point along the top rail. Cannot deflect to a height of less than 39 inches above the WW&S
- Steel banding and plastic banding are not used for top rails or midrails.
  Top rails and midrails are at least 0.25-inches in diameter or in thickness.

9.11.8. Handrails and Stair Rails Systems

The employer must ensure:

- Handrails are not less than 30 inches and not more than 38 inches, as measured from the leading edge of the stair tread to the top surface of the handrail.

- The height of stair rail systems installed before January 17, 2017 is not less than 30 inches from the leading edge of the stair tread to the top surface of the top rail and;
- The height of stair rail systems installed on or after January 17, 2017 is not less than 42 inches from the leading edge of the stair tread to the top surface of the top rail.
- The top rail of a stair rail system may serve as a handrail only when;
- The height of the stair rail system is not less than 36 inches and not more than 38 inches as measured at the leading edge of the stair tread to the top surface of the top rail and;
- The top rail of the stair rail system meets the other handrail requirements above and were installed before January 17, 2017.
- The minimum clearance between handrails and any other object is 2.25 inches.

9.11.9. Protection From Falling Objects – Toeboards

- Erected along the exposed edge of the overhead walking-working surface for a length that is sufficient to protect employees below.
- Minimum vertical height of 3.5 inches as measured from the top edge of the toeboard to the level of the walking-working surface.
- Not have more than a 0.25 inch clearance or opening above the walking-working surface.
- Are solid or do not have any opening that exceeds 1 inch at its greatest dimension.
- Capable of withstanding a force of at least 50 pounds applied in any downward or outward direction.

  Screening is to be used where tools or objects are piled higher than the toeboard.

9.12. Mechanic Repair Shop.

9.12.1. **Right to Know.** Employees must be notified in detail of the possible dangers of any of the chemicals they are using. OSHA insists that employees have a right to know how they might be affected by chemicals in the workplace.

9.12.1.1. The right to know standard requires detailed labeling of all chemicals, inventory lists with information, training for employees in the safe use of chemicals and a written plan that outlines how the workplace plans to follow the right to know provision.

9.12.1.2. Monthly Safety meeting and area inspections must be completed as per procedures located in section 9.

9.12.2. **Safety Data Sheets (SDS).** Safety Data Sheets provide information about products and chemicals such as ingredients, first aid and proper personal protective equipment (PPE). According to the Hazard Communication standard 29 CFR 1910.1200, all businesses must store SDSs for each hazardous chemical in the shop in a known and easily accessible location. SDSs contain valuable information about health hazards, environmental and disposal concerns, and protective measures associated with each chemical. Refer to **chapter 5.**

9.12.3. **Personal Protective Equipment (PPE).** Employers are responsible for assessing workplace hazards and identifying, providing, and training employees on the use and maintenance of PPE that corresponds to the nature of their work. Not only must employers provide appropriate PPE, but they must also enforce that it is used. Refer to **chapter 6.**

9.12.3.1 Eye Protection: Based on the task, workers may need protection against chemical splashes, vapors or mists, flying sparks or particles, or harmful glare (29 CFR 1910.133). Protective eyewear should fit properly and be appropriate for the work.

9.12.3.2 Hand Protection: Gloves are needed for many tasks in repair shops. The type of glove needed may vary from one task to another. Types may include leather, butyl, neoprene or nitrile depending on the task or requirements listed on the chemical SDS sheets. Latex gloves may pose an allergy risk and should be avoided in a shop environment.

9.12.3.3 Hearing Protection: If workers are exposed to a loud environment, provide earplugs or other ear protection. Note that a hearing conservation program is required whenever employee noise exposures equal or exceed 85 decibels over an eight-hour workday.

9.12.3.4 Paint Protection: Auto body shops require additional skin protection (for the head, face, and arms) for paint technicians during spray painting activities to protect against chemical exposures. These include protecting all exposed skin from harm with either a chemical resistant full-body suit or other non-static discharge producing outer clothing. Also, painters should protect their head and face with a hood and goggles – all exposed skin must be protected.

9.12.3.5 Respiratory Protection: Shops must develop a respiratory protection program. Respiratory protection programs include written workplace procedures, proper selection of NIOSH approved respirators, training, fit testing, inspection and maintenance, medical evaluations, work area surveillance, and provisions for clean breathing air when using supplied-air respirators. Tasks in your shop where OSHA requires that employees wear respirators include painting, sanding, welding and whenever ventilation controls and work practices are not adequate enough to reduce exposures. Refer to chapter 16.

9.12.3.6 Medical Evaluations: Employees who wear respirators or work in a task that requires the use of respiratory protection need to have a medical evaluation. An occupational physician or other licensed health care professional can perform medical evaluations for shops' respiratory protection programs. In addition, employees working with hazardous chemicals or substances may need to be enrolled in the medical monitoring program. Refer to chapter 16

9.12.4. **Work Area.** The floor must be kept uncluttered and should provide easy access for walking. Designated walkways must be delineated by a permanent marking device and kept

clear of all obstacles. Loose objects or parts should be stored on racks or shelves as opposed to being placed on the floor. All spills should be cleaned up immediately, and tools and parts that are not being used should be put away.

9.12.4.1. Tool Regulations: In 2018, 2 out of every 100 full-time shop employees were injured on the job. Many of these injuries were cutting and crushing injuries arising from the improper usage or maintenance of tools.

9.12.4.1.1. All tools must be maintained in good condition so that they may be safely used, and employees should be informed of the proper use of all tools and possible dangers. Some of the larger, more standardized tools, such as the car lift, hoists cranes, etc., must be inspected and serviced on a regular basis in order to be up to standard with OSHA. Refer to **section 9.7 for hand tools, section 9.9 for machinery and section 9.10 for hoist and cranes**

9.12.4.2. Lockout Tag-out: Repair shops contain both equipment and machinery that may need to be repaired. Refer to **section 9.8.** Control of Hazardous Energy for proper procedures and policy.

9.12.4.3. Flammable Storage Cabinets: OSHA requires that chemicals be stored properly in order to prevent accidents. Flammable liquids need to be stored separately from other types of chemicals, such as those that are corrosive or highly reactive. Shops should avoid storing flammable chemicals in direct sunlight or near heat sources. 29 CFR 1910.106 details the regulations regarding designated and approved fireproof cabinets. Refer to **section 9.2.5** for flammable storage.

9.12.4.4. Flammable Liquids Storage Rooms: Shops that do painting likely have a paint storage or mixing room. These must comply with OSHA ventilation requirements Refer to **section 9.2.5** for flammable storage..

9.12.4.5. Battery Maintenance: Batteries are used to power our automobiles, trucks, tractors, and construction or power equipment. There are different types of batteries such as lead-acid batteries, gel cells, and lead-calcium batteries. Most batteries contain sulfuric acid and lead. Because batteries contain chemicals, chemical reaction by-products, and an electrical current they can pose a hazard to workers if not handled properly. Workers that operate, maintain, and recharge batteries should use caution.

9.12.4.5.1. Before working with a Battery: Employees should have training in proper handling procedures. Consult the vehicle and battery owners' manuals for specific instructions on battery handling and hazard identification. To avoid splashing acid in your face, wear proper PPE such as chemical splash goggles and a face shield. Wear acid-resistant equipment such as gauntlet style gloves, an apron, and boots. Do not tuck your pant legs into your boots, this could cause spilled acid to form a pool in your

boots. Disconnect the battery cables. To avoid sparking, always disconnect the negative battery cable first and reconnect it last.

9.12.4.5.2. Performing Battery Maintenance: Battery maintenance tools should be covered with several layers of electrical tape to avoid sparking. Place protective rubber boots on battery cable connections to prevent sparking on impact if a tool does accidentally hit a terminal. Clean the battery terminals with a plastic brush because wire brushes could create static and sparks. Always remove your personal jewelry before working on a battery. A short-circuit current can weld a ring or bracelet to metal and cause severe burns.

9.12.4.5.3. Transporting Batteries: Batteries can be very dense and heavy, use proper lifting techniques to avoid back injuries. Battery casings can be brittle and break easily; they should be handled carefully to avoid an acid spill. Make sure that a battery is properly secured and upright in the vehicle or equipment.

9.12.4.5.4. Battery Hazards: If a battery shows signs of damage to the terminals, case or cover, replace it with a new one, dispose of old batteries properly.

9.12.5. Be careful with flammable fluids when working on a battery-powered engine. The electrical voltage created by batteries can ignite flammable materials and cause severe burns. Workers have been injured and killed when loose or sparking battery connections ignited gasoline and solvent fumes during vehicle maintenance.

9.12.6. Be aware of the chemical hazards posed by batteries. The sulfuric acid (electrolyte) in batteries is highly corrosive. Acid exposure can lead to skin irritation, eye damage, respiratory irritation, and tooth enamel erosion. Never lean over a battery while boosting, testing or charging it. In marine environments, do not allow the battery solution to mix with salt water; it can produce hazardous chlorine gas. If acid splashes on your skin or eyes, immediately flood the area with cool running water for at least 15 minutes and seek medical attention immediately.

9.12.7. Always practice good hygiene and wash your hands after handling a battery and before eating, avoid lead exposure. Signs of lead exposure include loss of appetite, diarrhea, constipation with cramping, difficulty sleeping, and fatigue.

9.12.8. The chemical reaction by-products from a battery include oxygen and hydrogen gas. These can be explosive at high levels. Overcharging batteries can also create flammable gases. For this reason, it is very important to store and maintain batteries in a well-ventilated work area away from all ignition sources and incompatible materials. Cigarettes, flames or sparks could cause a battery to explode.

9.13. Maintenance Station and Garage Facilities.
This section refers to both manned and unmanned structures within a supervisor's section. These areas are used for many different purposes, and therefore, may be subject to other sections of this manual, depending on the operation or task being performed.

9.13.1. **General Requirements.** All maintenance station and garage facilities shall meet these minimum safety standards, and shall meet the general guidelines and safety inspections as set forward in the Facilities section of this manual.

9.13.2. **Walkways.** Designated walkways should be determined by the supervisor and periodically inspected and evaluated. When changes to the layout of an area are considered, the walkway plan may need to be altered and re-marked.

9.13.2.1. All walkways should be 48 inches where possible. A minimum of 32 inches is required. Walkway areas should be permanently marked with clear, visible paint or other approved marking device. Walkway areas should grant access to frequently traveled areas in the facility and any other area that will require access during an emergency. These areas include emergency exits, electrical panels, eye-wash stations, first aid kits, fire extinguishers and AEDs. At no time shall objects that constitute a slip, trip, or fall hazard be placed in a walkway area. During seasonal activities, plows, mowers, chippers, and other various equipment may need to be placed in a facility that does not allow enough space for storage. In these cases, the equipment may need to be stored or may intrude into a walkway area. If this is the case, an effort to identify the hazard should be made and the exclusion of any obstacle that constitutes a slip, trip, or fall hazard still applies.

9.13.3. **Interior Building Markings.**

9.13.3.1. First Aid Devices: Any item associated with first aid, including first aid kits, AEDs, and eye-wash stations, should be clearly marked. These markings shall be green in color and may be placed on the wall and floor of the facility.

9.13.3.2. Fire Protection: Any device designated for fire prevention should be clearly marked. These marking shall be red in color and may be placed on the wall and floor of the facility. All extinguishers shall meet requirements stated in **section 9.2.2.**

9.13.3.3. Electrical Panels: Electrical panels shall be clearly marked. These marking shall be blue in color. Floor markings shall be designated to provide 36 inches of clearance around the panel. No objects or obstructions may enter this area. A wall marking should also be present at these locations. Additional electrical requirements are stated in **section 9.3** of this manual.

9.13.4. **Stairways, Wall/Floor Openings, and Ladders.** All areas designated for access by employees must be maintained and kept clear of obstruction to meet minimum safety standards. Refer to **section 9.11.**

9.13.5. **Grounds.** Entry to the grounds shall have adequate signs erected (and well maintained) to notify the public or trespassers as to the jurisdiction and regulations. Signs relative to speed, direction, and general traffic movement should be erected and kept in good condition. The grounds shall be well maintained, free of weeds and debris. Fences and gates will be kept in good condition so they are adequate for the use intended. Adequate security shall be maintained after hours and when there are no ITD employees present.

9.13.6. **Driveways.** Driveways will be kept in good condition, and material storage and parking shall not be permitted thereon. Definite parking areas shall be designated for ITD equipment and employees' and visitors' cars wherever possible. Traffic lines may be painted (where the conditions allow it) to guide the driver.

9.13.7. **Trash and Sewer.** Trash cans shall be maintained in convenient locations to receive all trash, including replaced and worn out parts, dirt, and general litter. Trash cans shall be emptied and their contents hauled away regularly. The trash containers shall not be permitted to overflow and clutter the dumping area. All sewer and drain lines shall be kept clear at all times.

9.13.8. **Windows.** Windows and skylights shall be kept clean and in good repair. No materials shall be stacked against windows.

9.13.9. **Bulletin Boards and Signs.** Every maintenance building, shop, or garage shall have a bulletin board reserved for and used exclusively for the posting of safety memoranda, posters, and other information pertaining to safety. The bulletin boards shall be located in a prominent, well-illuminated place where they will be readily accessible to the greatest number of employees. Safety posters and memoranda will be displayed for at least two weeks, and it will be the responsibility of the foreman or supervisor in charge to see that the board is kept current and neat and that the employees have read and initialed all safety information displayed. The condition of the safety bulletin board reflects the sincerity and interest toward the entire safety program.

9.13.10. **Personal Protective Equipment (PPE).** A wide range of PPE may need to be used in maintenance and garage facilities. PPE needed for specific tasks are covered in the appropriate section of this manual. But before engaging in any task, please refer to **chapter 6** of this manual.

9.13.11. **Ventilation and Heating/Cooling.** An exhaust ventilating system shall be provided in all buildings where exposure to dust, fumes, vapors, mists, or gases shall constitute a hazard to the health and comfort of the employees. The ventilating system shall be constructed so as to furnish a supply of fresh air or remove injurious vapors without creating drafts or lowering the comfortable temperature level.

9.13.11.1. Proper heating and a stable temperature shall be maintained in the shop and garage. Care should be taken to cut off all drafts and cold air leaks that would constitute a hazard to workers' health and comfort.

9.13.12. **Vehicles Parked Inside.** Running combustion engines emit gasses that are harmful to employees without proper ventilation. Vehicles shall not be "warmed up" in a maintenance or garage facility. The garage door must be opened prior to starting the vehicle and closed after the vehicle has exited. This will minimize exhaust gas exposure to the building occupants.

9.13.13. **Engine Testing Inside a Facility.** Any time a combustion engine is operated or tested inside a maintenance or garage facility, proper precautions must be made to limit exhaust exposure. An exhaust hood or vehicle exhaust hose that vents to the outside of the building must be used wherever possible. When this is not feasible, the exhaust source must be relocated outside the building.

9.13.14. **Hand Tools and Machinery.** A wide variety of hand tools and machinery may be present at a maintenance or garage facility. Employees must be trained to use the appropriate tool and machine for the job. It is essential that supervisors and fellow employees assist their co-workers in identifying safety issues and hazards associated with the use of tools and machinery, and the proper use of machine/tool guarding. Refer to section 9.8 for proper use and safety measures.

9.13.15. **Vehicle Maintenance.** Maintenance and garage facilities are frequently used as a mechanic repair shop. All rules, regulations, and policies, including those prescribed by OSHA regulations, must be adhered to when performing vehicle maintenance. Refer to **section 9.12**

9.13.16. **Material and Supply Storage.** Each maintenance and garage facility may have a wide variety of materials on hand, as well as different types of storage areas to maintain. It is imperative that no materials shall be stored in designated walkways or employee breakroom areas. Any supplies stored in break areas should not be placed in an area that may cause a health hazard or cross contamination with food storage or food preparation devices.

9.13.17. **Small Storage Areas.** Small storage areas shall be well organized and situated where a chemical or heat reaction between stored materials is less likely to occur. For example, Bleach stored next to Ammonia, or road flares stored next to flammable liquids, may pose a hazard if combined. Employees shall read and update a SDS book for all chemicals stored in their facility. Refer to chapter 5 for Hazard Communication. Storage devices such as racks and shelves must be kept in good order and replaced or repaired when needed. Walkways, doors, and access areas must be kept clear of all obstruction, moisture, dirt, and debris at all times.

9.13.18. **Flammable Storage.** Many types of chemicals used in maintenance and garage facilities are flammable. Some of these materials may be stored **unopened** on a rack or shelf until needed. Once the container is opened, these materials need to be stored in an appropriate cabinet or storage container. One opened, personal-use container may be placed outside of the storage cabinet during work hours, but it must be stored in the flammable cabinet when employees are not present in the building. Please refer to **section 9.2.5** for additional information on flammable storage.

9.13.19. **Compressed Gasses.** There are many types of compressed gasses located in a Maintenance and Garage facility. Please refer to **section 9.2.4** on compressed gasses.

9.13.20. **Large Storage Areas.** Outside storage areas may be used for equipment or materials needed for maintenance work. These areas should be pre-planned and organized for ease of storage and retrieval. Walkways, driveways, gates, and employee access points should be kept clean and maintained to offer a clear, flat, and stable floor. Objects that may constitute a slip, trip, or fall hazard must be removed immediately. Areas designated for vehicle access must be kept clear and should be signed if an unknown hazard exists or a navigation hazard is present (rough ground, dead end alleys, etc.). Mirrors should be mounted on blind corners and intersections to avoid the chance of collision. Items should be stacked accordingly to prevent them from tipping or falling off of supports or racks.

9.13.20.1. Large indoor storage and some outside storage areas may fall under the Warehouse Operations section of this manual.

9.14. Warehouse Operations.

The fatal injury rate for the warehousing industry is higher than the national average for all industries. Potential hazards for workers in warehousing include: unsafe use of forklifts, improper stacking of products, failure to use proper personal protective equipment, failure to follow proper lockout/tag out procedures, inadequate fire safety provisions, and repetitive motion injuries.

9.14.1. **Docks.** Injuries happen here when forklifts run off the dock, products fall on employees, or equipment strikes a person.

9.14.1.1. Dock Plates: Drive forklifts slowly on docks and dock plates. Always secure dock plates and check to see if the plate can safely support the load.

9.14.1.2. Dock Edges: Employees should always keep clear of dock edges and never back up forklifts to the dock's edge. Visual warnings shall be provided near dock edges.

9.14.1.3. Dock Jumping: Jumping down from or onto another dock ("dock jumping") shall be prohibited by employees.

9.14.1.4. Dock Ladders and Stairs: All dock ladders and stairs shall meet OSHA specifications.

9.14.2. **Forklifts.** About 100 employees are killed and 95,000 injured every year while operating forklifts in all industries. Forklift turnovers account for a significant percentage of these fatalities.

9.14.2.1. Load Handling with a Forklift: Follow safe procedures for picking up, putting down, and stacking loads. Drive safely, never exceeding 5 mph and slow down in congested areas or those with slippery surfaces. Never drive up to a person standing in front of a fixed object such as a wall or stacked materials. Prohibit stunt driving and horseplay. Do not handle loads that are heavier than the weight capacity of the forklift. Maintain sufficiently safe clearances for aisles and loading docks, or passages where forklifts are used.

9.14.2.2. Ventilation Hazards: Ensure adequate ventilation either by opened doors/windows or using a ventilation system to provide enough fresh air to keep concentrations of noxious gases from engine exhaust below acceptable limits. Train employees on the hazards associated with the combustion byproducts of forklift operation such as carbon monoxide.

9.14.2.3. Work Area Hazards: Provide covers and/or guardrails to protect workers from the hazards of open pits, tanks, vats, and ditches.

9.14.2.4. Forklift Operation: For additional hazards associated with forklifts, please refer to **section 9.13.1.**

9.14.3. **Conveyors.** Workers can be injured by the following: getting caught in pinch points or in the in-going nip points, being hit by falling products, or developing musculoskeletal disorders associated with awkward postures or repetitive motions.

9.14.3.1. Conveyor Safety: Inspect conveyors regularly. Ensure that pinch points are adequately guarded. See **section 9.9** for Machinery Guarding. Develop ways of locking out conveyors and train employees in these procedures. Refer to **chapter 13** on Lockout/Tag out. Provide proper lighting and working surfaces in the area surrounding the conveyor.

9.14.4. **Materials Storage.** Improperly stored materials may fall and injure workers.

9.14.4.1. Materials Storage Safety: Stack loads evenly and straight. Place heavier loads on lower or middle shelves. Remove one object at a time from shelves. Keep aisles and passageways clear and in good repair.

9.14.5. **Manual Lifting/Handling.** Back and other injuries may occur from improper lifting or overexertion. Refer to **chapter 2** for guidance on lifting and carrying.

9.14.6. **Hazard Communication.** Warehouses may have many hazardous, flammable, or corrosive chemicals stored in house. Spills, off-gassing, or other exposures may occur. Please refer to **chapter 5** on hazard communication.

9.14.7. **Poor Ergonomics.** Improper lifting, repetitive motion, or poor design of operations can lead to musculoskeletal disorders in workers. If possible, use powered equipment instead of requiring a manual lift for heavy materials. Reduce lifts from shoulder height and from floor height by repositioning the shelf or bin. Ensure overhead lighting is adequate for the task at hand. Provide employees with task-oriented ergonomic training. Use your legs and keep your back in a natural position while lifting. Test the load to be lifted to estimate its weight, size, and bulk, and to determine the proper lifting method. Get help if the load exceeds the maximum weight a person can lift safely without assistance. Don't twist while carrying a load, but shift your feet and take small steps in the direction you want to turn. Keep floors clean and free of slip and trip hazards.

9.14.8. **Battery Storage.** ITD stores batteries for a variety of reasons. Whether used to power cars, computers, or microwaves, batteries require a certain level of precaution to be stored safely. The Occupational Safety and Health Administration (OSHA) battery storage requirements provide specific guidelines that businesses must follow to ensure the safety of their workers and customers.

9.14.8.1. Barrier Protection: Batteries should be kept in a battery room, away from heavy traffic areas. If this is impractical, or if only a few batteries are kept on the premises, they should be kept in a closet or behind some kind of barrier that would prevent people from accidentally coming into contact with them. The barrier should be posted with "Explosion Hazard" and "No Smoking" signs. Seismic protection should be provided in earthquake-prone areas, and electrical outlets and light switches should be located outside of the room. Metal battery racks should be grounded and floors should be acid-resistant.

9.14.8.2. Ventilation: The room or closet where batteries are kept should be well-ventilated at all times. Batteries continuously give off a mixture of hydrogen and oxygen gas, and concentration of these fumes can be hazardous to workers' health and cause a combustion hazard. The exact amount of ventilation needed depends upon the size, type, and quantity of batteries stored. The Material Safety Data Sheet for the particular battery will provide recommended ventilation levels.

9.14.8.3. Cleanliness: Batteries should be kept clean and dry at all times. Moisture causes the cells to corrode, which can result in leakage. Accumulation of dust, dirt, and debris can also be corrosive, and it's a fire hazard as well.

9.14.8.4 Temperature: Never allow the battery storage area to exceed 100 degrees Fahrenheit. High ambient heat can cause some types of batteries to rupture and spill electrolyte solution, and certain types of batteries present a combustion hazard when off-gassing into a high-heat area.

9.14.8.5 Safety Equipment: All safety equipment should be easily accessible, including goggles, gloves, face shields, and aprons. An operational eye wash and body wash station should be available, and a class C fire extinguisher should be kept nearby. Clean rags and

a bottle of electrolyte-neutralizing solution should be kept in the room in case of leaks and spills.

9.14.8.6 Periodic Maintenance: Employees should perform visual safety inspections of stored batteries at least monthly. The batteries should be checked for corrosion, cracks, and leaks, and should be wiped down to prevent dust accumulation. The storage area's temperature should be checked, and all ventilation systems should be tested to ensure functionality. The employee should verify the availability of all safety equipment and should check the fire extinguisher to make sure it has been inspected as scheduled. If any part of the inspection is not right, appropriate and immediate action should be taken to rectify the issue.

9.14.9 **Battery Maintenance.** Maintenance on batteries may pose different hazards than battery storage. Please refer to **section 9.12.4.5.** on battery maintenance.

9.14.10. **Charging Stations.** Fires and explosion risks are possible unless proper guidelines are followed. Prohibit smoking and open flames in and around charging stations. Provide adequate ventilation to disperse fumes from gassing batteries. Ensure that fire extinguishers are available and fully charged. Provide proper personal protective equipment such as rubber gloves and eye/face protection. Properly position forklifts and apply brakes before attempting to change or charge batteries; follow required procedures when refueling gas or propane fueled forklifts. Provide conveyors, overhead hoists, or equivalent materials handling equipment for servicing batteries. Provide an eye-washing and safety shower facility for employees exposed to battery acids.

9.15. Eyewash and Shower Stations

General: Eyewash/shower stations are critical emergency safety equipment intended to mitigate eye injuries when control methods do not prevent exposure to a physical or chemical irritant or a biological agent. Authority: OSHA 29 CFR 1910.151, ANSI standard Z358.1.

9.15.1. **Eye/face Wash Station Requirements**

- Plumbed units are preferred where a clean water source is readily available.
- Controlled, low velocity flow completely rinses eyes and face and is not injurious to user.
- Hands-free valve activates in one second or less and remains open until manually closed.
- Water flow is sufficiently high to allow user to hold eyes open while rinsing
- Enough room for the user to be able to have their eyes in the fluid, while being able to open their eyelids with their hands.
- Spray heads are protected from airborne contaminants. Covers are removed by water flow.
- Unit delivers at least 3.0 gallons (11.4 liters) of water per minute for 15 minutes.

- Water delivered by eye/face wash shall be tepid (60-100°F).
- Water flow pattern is positioned between 33” (83.8cm) and 53” (134.6 cm) from the floor and at least 6” (15.3 cm) from the wall or nearest obstruction.
- Unit washes both eyes simultaneously.
- Eyewash or shower stations must be clean, sanitary, and operating correctly.
- Only potable water should be used for eyewash and shower facilities.

9.15.2. **Eye/Face Wash Stations Use:** Flushing times vary depending on the contaminant. Refer to the SDS for specific flushing instructions. Absent specific SDS instructions, general recommendations are:

- Five minutes, or so, for mild irritants or those contaminants that are non-irritants
- 15-20 minutes for irritants that are moderate to severe, or those types of chemicals that when absorbed through the skin can cause acute toxicity such as sodium chloride (salt), and magnesium chloride (mag)
- 30 minutes, or more, for irritants that are corrosive such as battery electrolyte (acid).
- 60 minutes for irritants such as potassium, sodium, or calcium hydroxide that are strong alkalis

9.15.3. **Emergency Shower Requirements**

- Water supply must provide at least 20 GPM for 15 minutes.
- Hands-free valve activates in one second or less and remains open until manually closed.
- Shower delivers 20 gallons (75.7 liters) of water per minute for 15 minutes in the required pattern.
- Height of water column is between 82” (208.3 cm) and 96” (243.8 cm) above the floor.
- Center of the water pattern is at least 16” (40.6 cm) from any obstruction.
- Easily located, accessible actuator is no more than 69” (173.3 cm) above floor.
- At 60” (152.4 cm) above the floor, the water pattern is at least 20” (50.8 cm) in diameter.
- Water delivered by shower shall be tepid (60-100°F).
- If provided, shower enclosure has a minimum diameter of 34” (86.4 cm)

9.15.4. **Eyewash/Drench Hose Unit Requirements**

- Water flow is sufficiently high to allow user to hold eyes open while rinsing.
- Spray heads are protected from airborne contaminants. Covers are removed by water flow.
- Controlled, low velocity flow rinses both eyes and is not injurious to user.
- Unit delivers at least 0.4 gallons (1.5 liters) of water per minute for 15 minutes.
- Hands-free stay-open valve activates in one second or less.
- Valve actuator is easy to locate and readily accessible to user.

- Water flow pattern is positioned between 33” (83.8 cm) and 53” (134.6 cm) from the floor and at least 6” (15.3 cm) from the wall or nearest obstruction.
- Unit washes both eyes simultaneously. Water flow covers area indicated on Guardian test gauge at no more than 8” above spray heads.
- Water delivered by eyewash/drench hose unit shall be tepid (60-100°F).

9.15.5**. Self-Contained Eye/Face Wash Station Requirements**

Self-contained, portable, gravity fed eyewash stations are an acceptable option if there is no permanently plumbed potable water available. Use of anti-bacterial preservative additive is highly encouraged to extend the service life of the eye wash fluid and prevent eye injury from single cell organisms in water such as amoebas, pseudomonas and listeria.

- Eyewash and eye/face wash controlled, low velocity flow rinses both eyes and is not injurious to user
- Water flow is sufficiently high to allow user to hold eyes open while rinsing
- Spray heads are protected from airborne contaminants - covers are removed by water flow
- Gravity-fed (self-contained) eyewash must deliver at least 0.4 gallons of water per for 15 minutes
- Gravity-fed (self-contained) eye/face wash must deliver at least 3.0 gallons of water per for 15 minutes
- Water flow pattern is positioned between 33 and 53 inches from the surface on which the user stands and at least 6- inches from the wall or nearest obstruction
- Valve actuator is easy to locate and readily accessible to user
- Unit washes both eyes simultaneously
- Self-contained units must be visually checked weekly to determine if the flushing fluid needs to be changed or supplemented in accordance with the manufacturer’s instructions
- Expired anti-bacterial preservative solutions must not be used in self-contained systems.

9.15.5.1. Solution Changing: Self-contained eye/face wash stations filled with only potable water shall be drained, cleaned and refilled monthly. Stations with water and anti-bacterial preservative should be changed according to preservative manufacturer instructions, usually every three to six months.

- Drain all the water from the tank
- If possible, remove the spray heads and any tubing so they can be cleaned
- Clean the exterior of the unit, and then use a soft brush, mild soap and warm water to clean the inside
- Drain the wash water and rinse thoroughly
- Reattach the spray heads and tubing if they were removed

- Fill the unit with tepid, potable water
- Add the water preservative (if used)

9.15.6. **Training:** Instruct all employees in the location and proper use of eye/face wash units as part of your Hazard Communication (HazCom) Program.

9.15.7. **Weekly Testing:** Permanently plumbed eye/face wash and emergency showers area prone to accumulate stagnate, sediment-laden water. To combat this, employees should momentarily run all equipment weekly to verify proper flow and clearing the plumbing of any deposits.

- •Plumbed units must be activated on a weekly basis long enough to ensure that flushing fluid is provided
- If your facility does not have floor drains installed, remember to bring a large, plastic trash can to catch the water.
- The weekly flushing can also provide a great training opportunity to refresh the operation and travel paths for your employees.
- Self-contained units should be maintained in accordance with the manufacturer's instructions. Particular attention must be given to flushing fluid and availability.

9.15.7.1. Testing Documentation

- Affix a tag/inspection document on or near the eyewash station. (see attached for an example)
- Initial and date in the corresponding box verifying that the emergency eyewash / shower is checked weekly to ensure:
  - Pathway and access is clear of obstructions
  - Plumbed equipment activated to ensure compliant operation and to clear any sediment (allow the unit to run for at least <u>one minute</u> during test)
  - Self-contained equipment checked to determine if the flushing fluid needs to be changed or supplemented
  - Document the date of fluid change on inspection tag/document.

Chapter 10 – Field Operations

NOTE

Compliance with this safety manual is mandatory for all ITD employees. The practices outlined in this manual are designed to keep ITD employees safe from injury while on the job. This content, procedures and best practices are gleaned from various industry standards. In the interest of keeping this manual short, some guidance and procedures are referenced to other outside sources including OSHA standards. This does not indicate that ITD follows OSHA in all instances, or that OSHA standards apply to the State of Idaho. Rather the references in this manual to some OSHA standards is merely an acknowledgment that in certain specific instances OSHA has identified and articulated the best guidance available as a best practice.

10.1. Personal Safety.
All employees are not only charged with responsibility for their own safety, but shall always take into consideration the safety of fellow workers. Even though all of the obvious safety precautions have been taken to protect employees on the job, individuals shall be observant and alert for unexpected and unforeseen threats to their safety. Personal protective equipment shall be worn as stated in the Chapter 6 of this manual. Any careless or thoughtless act or omission not covered generally or specifically by these regulations shall be construed as a failure to abide by good safe practices and shall be subjected to review and possible disciplinary action.

10.1.1. **Wildlife**

10.1.1.1. Employees should always avoid wildlife. Even the smallest bite or scratch has been known to transmit deadly disease or toxins. Do not antagonize, capture or kill wildlife. Employees will notify Idaho Fish and Game of any nuisance wildlife impeding ITD operations.

10.1.1.2. Avoiding Snake Bites: Wear boots and trousers or gaiters when bushwalking. Be aware of where you are placing your feet. Do not put hands or feet in or under logs, rocks, hollows, crevices or debris without checking first that there is no snake there. When you encounter a venomous snake, just back away slowly and go around it.

10.1.1.2.1. Snakebite: Do not cut the bite and suck out the poison. Wash the bite with soap and water. Keep the bitten area still and lower than the heart. Cover the area with a clean, cool compress or a moist dressing to ease swelling and discomfort. Monitor breathing and heart rate. Remove all rings, watches, and constrictive clothing, in case of swelling. Transport to nearest urgent care facility ASAP

10.1.2. Isolated Locations. Personnel working in remote and isolated areas, or away from their normal assigned headquarters overnight or longer, shall take the following precautions:

10.1.2.1. When leaving for the remote or isolated area, inform some reliable person(s) of the general location in which you propose to be working and your anticipated time of return. Further, request of the informed person(s) that if you do not return within a given length of time after your predetermined arrival time, they should contact ITD's Maintenance Foreman for that area. Be sure to check in when you return to avoid any unnecessary search efforts.

10.1.2.2. If you are working out of your regularly assigned district, contact the ITD's district headquarters in which you are working and inform them that you are in their district and will be working in a particular geographic location. It is preferable that you leave a copy of your tentative schedule with the district. Obtain the Maintenance Foremen's names and addresses for the areas in which you will be working.

10.1.2.3. Upon arrival at the remote work location, verify your ITD radio signal strength by contacting State Communication Center or the District, you should also check for Cell Phone Signal.

10.1.2.4. In every case, employees going into such locations should ensure themselves of adequate clothing compatible to the season and an ample supply of water and food for an additional 24 hours. Care should be taken to assure that adequate emergency equipment, such as first-aid kits, shovels, tire chains, tow chains, flashlight, matches, etc., are in the vehicle.

10.1.2.5. If stranded, stay with your vehicle. If for any reason you must leave your vehicle, leave a note indicating intended direction of travel and destination; in most cases your vehicle is your safest protection and shelter.

10.1.1.5.1. If this procedure is properly coordinated, no one should be left stranded for more than a few hours—close compliance is a must.

10.1.3. **Horseplay.**

10.1.3.1. Horseplay will not be tolerated by ITD and will be cause for disciplinary action. Practical jokes and misuse of ITD equipment for purposes of intended humor are prohibited. Immediate supervisors shall be responsible for the actions of their crew.

10.1.4. **Lifting and Material Handling.**

10.1.4.1. Before attempting to lift by hand, employees shall establish whether additional help will be needed to safely lift the load and, if necessary, get that help. They shall make sure of good footing and never attempt to lift while off balance or in an awkward position. Obtain a good handhold that will not slip, and then lift with the legs, using a free, easy motion without jerking.

10.1.4.2. Employees must not try to over-lift. If a big load must be lifted, help shall be obtained. Proper lifting and carrying techniques shall be applied at all times.

10.1.4.3. The load shall be placed so that it will not fall and cause injury. Loads that obstruct the view of the carrier are considered too big and should be carried by more than one person, or another method used to move the load.

10.1.5. **Clothing/PPE.** Refer to Chapter 6 Personal Protective Equipment (PPE).

10.1.6. **Sanitation.**

10.1.6.1. Drinking water will be obtained only from approved sources. Care should be taken to avoid the dangers of contamination.

10.1.6.2. Fountains or individual paper cups should be furnished where possible. Under all conditions, individual drinking cups should be used; a common drinking cup or other common utensil is prohibited.

10.1.7. **Tools.** If hand tools are necessary refer to **chapter 9.7.**

10.1.8. **Vehicle and Equipment Safety.**

10.1.8.1. When operating department vehicles employees shall obey all Federal, State and Local traffic laws. Keep in mind that we are always in the public eye.

10.1.8.2. For further reference, refer to **chapter 12** Equipment Safety.

10.1.9. **Port of Entry Safety.**

10.1.9.1. Smoking Near Explosive, Oxidizing, or Flammable Materials in Vehicles**.**

10.1.9.1.1. *Federal Motor Carrier Safety Rule 397.13* reads: "397.13 Smoking. No person may smoke or carry a lighted cigarette, cigar or pipe on or within 25 feet of:

a. A motor vehicle which contains explosives, oxidizing materials or flammable materials; or
b. An empty tank motor vehicle which has been used to transport flammable liquids or gases and which when so used, was required to be marked or placarded in accordance with the rule in Section 177.823 of this title."

10.1.9.1.2. POE personnel should be aware of this rule when on duty. This applies to anyone in or around the POE facility where a vehicle of this type would be operated or parked.

10.1.9.1.3. Do not allow smoking or lighted materials within 25 feet of these vehicles. Be especially aware of:

10.1.9.1.3.1. Walk-in traffic entering or leaving your building.

10.1.9.1.3.2. Pedestrian traffic in the parking area.

10.1.9.1.4. "No Smoking" signs shall be placed in strategic locations, area permitting. The area supervisor shall provide restricted parking areas for these

vehicles. In addition, signing shall be erected stating "No Smoking" within 25 feet of the area.

10.2. Seasonal Safety Issues.

10.2.1. **Winter Weather.** Winter storms create a higher risk of car accidents, hypothermia, frostbite, carbon monoxide poisoning, and heart attacks from overexertion. Winter storms and blizzards can bring extreme cold, freezing rain, snow, ice, and high winds.

10.2.1.1. **Dressing Properly for the Cold.**

10.2.1.1.1. Dressing properly is extremely important to preventing cold stress. When cold environments or temperatures cannot be avoided, the following will help protect from cold stress:

10.2.1.1.1.1. Wear at least three layers of loose-fitting clothing. Layering provides better insulation.

10.2.1.1.1.2. An inner layer of wool, silk or synthetic (polypropylene) to keep moisture away from the body. Thermal wear, wool, silk or polypropylene, inner layers of clothing that will hold more body heat than cotton.

10.2.1.1.1.3. A middle layer of wool or synthetic to provide insulation even when wet.

10.2.1.1.1.4. An outer wind and rain protection layer that allows some ventilation to prevent overheating.

10.2.1.1.1.5. Tight clothing reduces blood circulation. Warm blood needs to be circulated to the extremities.

10.2.1.1.1.6. Insulated coat/jacket (water resistant if necessary).

10.2.1.1.1.7. Knit mask to cover face and mouth (if needed).

10.2.1.1.1.8. Hat that will cover your ears.

10.2.1.1.1.9. Insulated gloves (water resistant if necessary), to protect the hands.

10.2.1.1.1.10. Insulated and waterproof safety toed boots to protect the feet.

10.2.1.2. **Working in the Cold.**

10.2.1.2.1. Preventing Slips on Snow and Ice. When walking on snow or ice is unavoidable, workers should:

10.2.1.2.1.1. Wear footwear that has good traction and insulation (e.g. insulated and water-resistant boots or rubber over-shoes with good rubber treads).

10.2.1.2.1.2. Take short steps and walk at a slower pace to react quickly to changes in traction.

10.2.1.2.2. Recognize and Respond:

10.2.1.2.2.1. Frostbite: causes loss of feeling and color around the face, fingers, and toes.

10.2.1.2.2.1.1. Signs: Numbness, white or grayish-yellow skin, firm or waxy skin.

10.2.1.2.2.1.2. Actions: Go to a warm room. Soak in warm water. Use body heat to warm. Do not massage or use a heating pad.

10.2.1.2.2.2. Hypothermia: an unusually low body temperature. A temperature below 95 degrees is an emergency.

10.2.1.2.2.2.1. Signs: Shivering, exhaustion, confusion, fumbling hands, memory loss, slurred speech, or drowsiness.

10.2.1.2.2.2.2. Actions: Go to a warm room. Warm the center of the body first—chest, neck, head, and groin. Keep dry and wrapped up in warm blankets, including the head and neck.

10.2.1.3. **Winter Vehicle Preparation.** A winter-ready vehicle is as important as good winter driving skills. Make sure to do your driver daily checklist, located in the front of the fuel book, have a full tank of fuel, make sure your vehicle is clean and cleared off.

10.2.1.3.1. Equip your vehicle with a winter survival kit with these recommended items:

10.2.1.3.1.1. Cellphone or Two-Way Radio

10.2.1.3.1.2. First Aid Kit

10.2.1.3.1.3. Windshield Ice Scraper/Brush

10.2.1.3.1.4. Flashlight, Extra Batteries

10.2.1.3.1.5. Shovel

10.2.1.3.1.6. Traction Aids – Bag of Sand or Cat Litter)

10.2.1.3.1.7. Sand Bags, for Extra Weight – Know Your Vehicle

10.2.1.3.1.8. Emergency Flares

10.2.1.3.1.9. Jumper Cables

10.2.1.3.1.10. Extra Windshield Washer Fluid & Wipers

10.2.1.3.1.11. Nonperishable Food & Drinking Water

10.2.1.3.1.12. Road Maps

10.2.1.3.1.13. Blankets, Change of Clothing & Footwear

10.2.1.3.1.13.1. Make a “go” bag to take with you on every trip.

10.2.1.4. **Winter Driving.**

10.2.1.4.1. During winter weather driving hazards jump dramatically. When you’re behind the wheel, driving is your only job. A few reminders to help you drive safely:

10.2.1.4.1.1. Give yourself extra time for travel, so you’re not rushing.

10.2.1.4.1.2. Reduce your speed. The posted speed is for ideal conditions.

10.2.1.4.1.3. Follow at a safe distance.

10.2.1.4.1.4. Watch for black ice. Shaded areas, bridges, and overpasses freeze sooner than other areas – even in sunshine.

10.2.1.4.1.5. Avoid sudden moves. Accelerating, braking, turning – do everything gently and gradually to avoid spinning your tires.

10.2.1.4.1.6. Check 511 before you travel and know the road conditions.

10.2.1.4.1.7. If you become stuck or stranded, radio or call for assistants. Stay with the vehicle for warmth and safety. If it’s an emergency, radio or call State Communication or 911.

10.2.1.4.2. For more information on winter refer to Chapter 7, Snow and Ice Control, in the Operations Manual.

10.2.2. **Summer Weather.** Hot summer months pose special hazards for outdoor workers who must protect themselves against heat, sun exposure, and other hazards. Employers and employees should know the potential hazards and how to manage them.

10.2.2.1. **Sun.** Sunlight contains ultraviolet (UV) radiation, which causes premature aging of the skin, wrinkles, cataracts, and skin cancer. There are no safe UV rays or safe suntans. Be especially careful in the sun if you burn easily, spend a lot of time outdoors, or have any of the following physical features: numerous, irregular, or large moles; freckles; fair skin; or blond, red, or light brown hair. Here’s how to block those harmful rays:

10.2.2.1.1. Cover up. Wear loose-fitting, long-sleeved shirts and long pants.

10.2.2.1.2. Use sunscreen with a sun protection factor (SPF) of at least 30. Be sure to follow application directions on the bottle or tube.

10.2.2.1.3. Wear a hat. A wide brim hat, not a baseball cap, works best because it protects the neck, ears, eyes, forehead, nose, and scalp.

10.2.2.1.4. Wear UV-absorbent sunglasses (eye protection). Sunglasses don’t have to be expensive, but they should block 99 to 100 percent of UVA and UVB radiation. Before you buy sunglasses, read the product tag or label.

10.2.2.1.5. Limit exposure. UV rays are most intense between 10 a.m. and 4 p.m.

10.2.2.2. **Heat.** The combination of heat and humidity can be a serious health threat during the summer months and increased risk for heat related illness. So, take precautions. Here's how:

10.2.2.2.1. Drink small amounts of water frequently.

10.2.2.2.2. Wear light-colored, loose-fitting, breathable clothing—cotton is good.

10.2.2.2.3. Take frequent short breaks in cool shade.

10.2.2.2.4. Eat smaller meals before work activity.

10.2.2.2.5. Avoid caffeine and alcohol or large amounts of sugar.

10.2.2.2.6. Work in the shade, when possible.

10.2.2.2.7. Find out from your health care provider if your medications and heat don't mix.

10.2.2.2.8. Know that equipment such as respirators or work suits can increase heat stress.

10.2.2.2.9. There are three kinds of major heat-related disorders—heat cramps, heat exhaustion and heat stroke. You should be trained on how to recognize each one and what first aid treatment is necessary.

10.2.2.3. **Lyme Disease/Tick-Borne Diseases.** These illnesses (i.e., Rocky Mountain spotted fever) are transmitted to people by bacteria from bites of infected deer (blacklegged) ticks. In the case of Lyme disease, most, but not all, victims will develop a "bulls-eye" rash. Other signs and symptoms may be non-specific and similar to flu-like symptoms such as fever, lymph node swelling, neck stiffness, generalized fatigue, headaches, migrating joint aches, or muscle aches. You are at increased risk if your work outdoors involves construction, forestry, brush clearing, land surveying. Protect yourself with these precautions:

10.2.2.3.1. Wear light-colored clothes to see ticks more easily.

10.2.2.3.2. Wear long sleeves; tuck pant legs into socks or boots.

10.2.2.3.3. Wear high boots or closed shoes that cover your feet completely.

10.2.2.3.4. Wear a hat.

10.2.2.3.5. Use tick repellants, but not on your face.

10.2.2.3.6. Shower after work. Wash and dry your work clothes at high temperature.

10.2.2.3.7. Examine your body for ticks after work. Remove any attached ticks promptly and carefully with fine-tipped tweezers by gripping the tick. Do not use petroleum jelly, a hot match, or nail polish to remove the tick.

10.2.2.4. **West Nile Virus.** West Nile virus is transmitted by the bite of an infected mosquito. Mild symptoms include fever, headache, and body aches, occasionally with a skin rash on the trunk of the body and swollen lymph glands. Symptoms of severe infection include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis. You can protect yourself from mosquito bites in these ways:

10.2.2.4.1. Apply Picaridin or insect repellent with DEET to exposed skin.

10.2.2.4.2. Spray clothing with repellents containing DEET or permethrin. (Note: Do not spray permethrin directly onto exposed skin.)

10.2.2.4.3. Wear long sleeves, long pants, and socks.

10.2.2.4.4. Be extra vigilant at dusk and dawn when mosquitoes are most active.

10.2.2.4.5. Get rid of sources of standing water (used tires, buckets) to reduce or eliminate mosquito breeding areas.

10.2.2.5. **Poison Ivy-Related Plants.** Poison ivy, poison oak and poison sumac have poisonous sap (urushiol) in their roots, stems, leaves and fruits. The urushiol may be deposited on the skin by direct contact with the plant or by contact with contaminated objects, such as clothing, shoes, tools, and animals.

10.2.2.5.1. Approximately 85 percent of the general population will develop an allergy if exposed to poison ivy, oak or sumac. Forestry workers and firefighters who battle forest fires have developed rashes or lung irritations from inhaling the smoke of burning plants.

10.2.2.5.1.1. Wear long-sleeved shirts and long pants, tucked into boots. Wear cloth or leather gloves.

10.2.2.5.1.2. Apply barrier creams to exposed skin.

10.2.2.5.1.3. Educate workers on the identification of poison ivy, oak, and sumac plants.

10.2.2.5.1.4. Educate workers on signs and symptoms of contact with poisonous ivy, oak, and sumac.

10.2.2.5.1.5. Keep rubbing alcohol accessible. It removes the oily resin up to 30 minutes after exposure.

10.2.2.6. **Summer Vehicle Preparation.** Make sure to do your driver daily checklist, located in the front of the fuel book, and equip your vehicle with a survival kit with these recommended items:

10.2.2.6.1. Cellphone or Two-Way Radio

10.2.2.6.2. First Aid Kit

10.2.2.6.3. Flashlight

10.2.2.6.4. Emergency Flares

10.2.2.6.5. Jumper Cables

10.2.2.6.6. Nonperishable Food & Drinking Water

10.2.2.6.7. Extra Windshield Washer Fluid & Wipers

10.2.2.6.8. Road Maps

10.2.2.6.9. Blankets, Change of Clothing, and Footwear

10.2.2.6.9.1. Make a "go" bag to take with you on every trip.

10.2.3. **Rain:** Working in the rain can cause slippery surfaces and limited visibility. However, steps can be taken to mitigate such hazards.

10.2.3.1. When working in the rain it's recommended to:

10.2.3.1.1. Move cautiously. Although the weather may make you inclined to work more quickly to get out of the rain, this is dangerous. Because rain causes slick surfaces, work more slowly and deliberately – particularly when climbing ladders.

10.2.3.1.2. Use the correct equipment. Do not use electrical tools and equipment that are not specifically rated for outdoor use when working in the rain. Select hand tools with textured, nonslip grip handles.

10.2.3.1.3. Wear proper footwear with a deep tread to prevent slipping. In the rain, be sure your pant leg lies over your boot or shoe. Tucking your pants into footwear can cause water to enter.

10.2.3.1.4. Wear appropriate rain gear that includes both pants and a coat. Be sure the material is ventilated so it can be worn comfortably for extended periods. If it is cold, select wool or synthetic materials that insulate even when wet. Be certain clothing fits properly so it does not interfere with movement.

10.2.3.1.5. Use proper hand protection that features a strong, slip-proof grip. Make sure gloves are adequately tight and long enough to allow your rain coat sleeve to prevent water from entering.

10.2.3.1.6. Ensure adequate vision. If you wear glasses or goggles, use anti-fog spray or wipes on them before going outside. Wear a hood or hat to keep rain out of your eyes. Because a hood narrows your range of vision, be sure to look both ways when wearing one. When working at night, make sure lighting is adequate and the lights used are rated for outdoor use.

10.2.3.1.7. Make sure you can be seen. Wear high-visibility clothing, especially in areas with vehicle traffic and heavy machinery. Do not wear rain gear or vests that have become dull or are no longer reflective.

10.2.4. **Standing/Flowing Water.** Exercise extreme caution when driving through or crossing standing or flowing water.

10.2.4.1. Whenever possible use heavy equipment to enter flood waters to begin emergency repairs until water depth can be determined.

10.2.4.2. Reduce vehicle speed to reduce chances of stalling or hydroplaning.

10.2.5. **High Winds.** To prevent unnecessary workplace injuries and tragedies, it is imperative that workers know the appropriate measures to take ensure their own safety, and that of their co-workers and bystanders around them. As always, preparing for hazards is the best measure:

10.2.5.1. Check weather reports and monitor conditions continuously. Do not schedule work at elevations on days where high winds are forecast.

10.2.5.2. Wear eye protection to keep dust, debris and other foreign particles from blowing into the eyes.

10.2.5.3. Ensure hard hats are securely fastened and cannot be blown off.

10.2.6. **Thunderstorms & Lightning.** Thunder and lightning storms are dangerous and can include powerful winds over 50 MPH, create hail and cause flash flooding. Seek shelter and pay attention to alerts and warnings. Check the weather forecast and schedule work according.

10.3. Working in the Right of Way.

Supervisors will be responsible to see that all necessary signs, warnings, and flaggers are stationed to protect the crew when they are working on or adjacent to a highway (Refer to MUTCD Manual). Employees should work facing oncoming traffic if possible. Every employee should look both ways, not just listen, before crossing the highway. A high-visibility yellow reflectorized outer garment meeting ANSI Class 3 standard and Class E hard hat, when required, shall be worn at all times when working on or near the roadway.

10.3.1. **Traffic Control.** Refer to **chapter 11**.

10.3.2. **Emergency Median Crossovers (General Procedures).**

10.3.2.1. Emergency (maintenance) median crossovers on access controlled divided highways are designed for highway operations crews, POE and emergency vehicles as per administrative policy 5531, and can be quite safe if used properly.

10.3.2.2. Operations crews use median crossovers for a variety of reasons including; picking up debris, litter, roadkill removal, responding to accidents, traffic control, stranded motorists and snow plowing operations.

10.3.2.3. Median crossovers may be utilized at one or both ends of interchange facilities, depending on interchange type, for the purpose of snow removal and at other locations to facilitate maintenance operations.

10.3.3. **Best Practices for Use.**

10.3.3.1. Median crossovers are to be used by operations personnel if they are located further than 1500 feet from the end of a ramp or any structure.

10.3.3.2. Median crossovers should only be used where above-minimum stopping sight distance is provided and preferably should not be used when the crossover is located within curves requiring super elevation.

10.3.3.3. In rural areas, median crossovers may be the best option when the distance between interchanges is greater than 5 miles.

10.3.3.4. When working in urban areas it is preferable to use interchanges instead of median crossovers.

10.3.3.5. A best practice for use of median crossovers is to pull to the right shoulder of the highway and wait to enter the crossover when traffic allows. Slowing and entering a crossover from the far left (passing) lane should be avoided unless traffic volume and speed allows it to be done safely.

10.3.4. **Low and Moderate Volume Traffic Crossover.**

10.3.4.1. Signal your intention well in advance of the median crossover (turn on flashing lights at least a ½ mile prior to the crossover and turn signal at least 500 feet prior to the crossover).

10.3.4.2. Pull to the right shoulder of the roadway and wait for a sufficiently sized gap that will allow you to pull into the median crossover in a safe manner.

10.3.4.3. Turn into the median crossover and proceed to the other side.

10.3.4.4. Only enter into the lane of traffic when traffic allows and it is safe to do so. If traffic volume warrants; wait for a sufficiently sized gap in traffic that will allow you to pull to the right shoulder of the roadway and enter into the lane of traffic when conditions allow.

10.3.5. **High Volume Traffic Crossover.**

10.3.5.1. Proceed to the next interchange and turn around. Do NOT attempt to use the median crossover; safety and the traveling public's safety could be at great risk.

10.3.5.2. For the procedure to determine traffic volumes consult chapter 2 "Traffic Conditions" in the Operations Manual.

10.4. Trenching & Excavation Safety.

Warning

Always call dig line (811) before digging.

10.4.1. General Information.

10.4.1.1. Excavation and trenching are among the most hazardous construction operations. The Occupational Safety and Health Administration's (OSHA) Excavation standards, 29 Code of Federal Regulations (CFR) Part 1926, Subpart P, contain requirements for excavation and trenching operations. This section highlights key elements of the standards and describes safe work practices that can protect workers from cave-ins and other hazards. 10.4.1.2. Terms and Definitions:

- **Excavation:** OSHA defines an excavation as any man-made cut, cavity, trench, or depression in the Earth's surface formed by earth removal.
- **Trench:** A trench is defined as a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth of a trench is greater than its width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).
- **Protective Works:** A trench or excavation 5 feet (1.5 meters) deep or greater requires protective works.
- **Egress Ladders:** Ladders or stairs are required at depths of 4 feet or greater.

10.4.2. Hazards.

10.4.2.1. Trenching and excavation work presents serious hazards to all workers involved. Cave-ins pose the greatest risk and are more likely than some other excavation-related incidents to result in worker fatalities. One cubic yard of soil can weigh as much as a car. Employers must ensure that workers enter trenches only after adequate protections are in place to address cave-in hazards. Other potential hazards associated with trenching work include falling loads, hazardous atmospheres, and hazards from mobile equipment.

10.4.3. Applicability.

10.4.3.1. The standards apply to all open excavations made in the Earth's surface, including trenches. Following the requirements of this section will prevent or greatly reduce the risk of cave-ins and other excavation-related incidents.

10.4.4. Soil Classification.

10.4.4.1. Some of the compliance methods permitted under the Excavation standards require a competent person to classify soil and rock deposits as:

10.4.4.1.1. Stable rock: Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

10.4.4.1.2. Type A soil: Cohesive soils including clay, silty clay, sandy clay, and clay loam. Certain conditions preclude soil from being classified as Type A. For example, no soil is Type A if it is fissured or has been previously disturbed.

10.4.4.1.3. Type B soil: Granular cohesionless soils (such as angular gravel, similar to crushed rock, silt, silt loam, sandy loam, and, in some cases, silty clay loam and sandy clay loam).

10.4.4.1.4. Type C soil: Granular soils (including gravel, sand, and loamy sand), submerged soil or soil from which water is freely seeping, submerged rock that is not stable, or material in a sloped, layered system where the layers dip into the excavation or with a slope of four horizontal to one vertical (4H:1V) or steeper.

10.4.4.1.4.1. Soil classification for all trenching and excavations within the right of way or culverts under or adjacent to roadways is considered to be Class C – Previously Disturbed soil. Additionally, road or construction traffic in the area may cause ground vibrations increasing the possibility of a cave-in.

10.4.4.1.4.2. Protective works are required when an excavation is 5 feet (1.5 meters) deep or greater. Egress ladders are required at depths of 4 feet or greater.

10.4.4.1.5. **Note:** 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 by a competent person using a pocket penetrometer, thumb penetration tests, or other methods.

10.4.5. **Competent Person.**

10.4.5.1. A competent person is an individual, designated by the employer, who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to workers, and who is authorized to take prompt corrective measures to eliminate them.

10.4.5.2. Under the Excavation standards, tasks performed by the competent person include:

10.4.5.2.1. Classifying soil

10.4.5.2.2. Inspecting protective systems

10.4.5.2.3. Designing structural ramps

10.4.5.2.4. Monitoring water removal equipment

10.4.5.2.5. Conducting site inspections

10.4.6. **Preplanning.**

10.4.6.1. No matter how many trenching, shoring, and backfilling jobs an employer has done in the past, it is important to approach each new job with care and preparation. Many on-the-job incidents result from inadequate initial planning. Waiting until after the work starts to correct mistakes in shoring or sloping slows down the operation, adds to the cost of the project, and makes a cave-in or other excavation failure more likely.

10.4.6.2. Safety Factors to be considered:

10.4.6.2.1. Traffic

10.4.6.2.2. Proximity and physical condition of nearby structures

10.4.6.2.3. Soil classification

10.4.6.2.4. Surface and ground water

10.4.6.2.5. Location of the water table

10.4.6.2.6. Overhead and underground utilities

10.4.6.2.7. Weather

10.4.6.2.8. Availability of shoring or protective systems

10.4.6.2.9. Fall protection needs

10.4.6.2.10. Number of ladders that may be needed

10.4.6.2.11. Other equipment needs

10.4.6.3. Preparation:

10.4.6.3.1. Determine soil type or conditions (NOTE: for ITD's purposes all soil will be treated as Type C – Previously Disturbed soil unless a materials engineer has determined otherwise)

10.4.6.3.2. Obtain safety equipment including trench box.

10.4.6.3.3. Call 811 Utility Locate / Dig Line to determine the approximate location(s) of utility installations —including sewer, telephone, fuel, electric, and water lines. **Note:** All work within 2 feet of marked utilities shall be done with hand tools

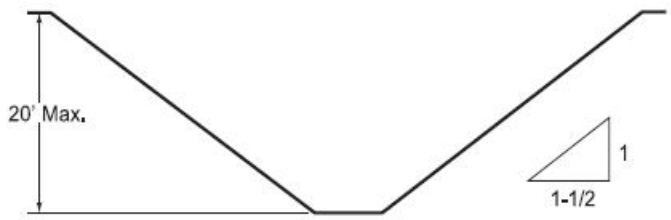
10.4.6.3.4. Contact the utility companies or owners involved to inform them of the proposed work.

10.4.7. **Protective Systems.**

10.4.7.1. Supervisors are required to protect workers from cave-ins. Examples of protective systems that can be used to comply with the Excavation standards include:

10.4.7.1.1. Sloping and benching the sides of the excavation to an angle not steeper than 1½:1 (for every foot of depth, the trench must be excavated back 1½ feet). A slope of this gradation is safe for any type of soil.

Figure 10.1. Slope of 1½:1

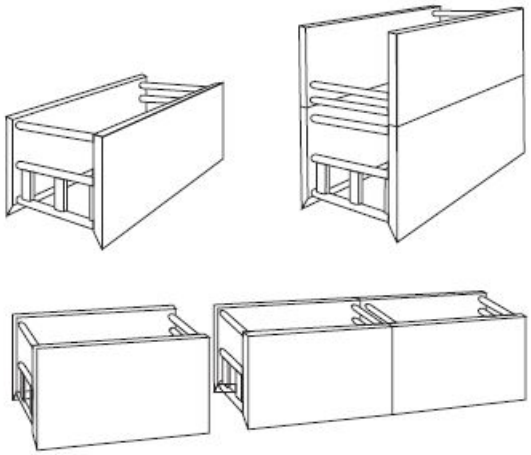


10.4.7.1.1.2. Other sloping and benching systems must be designed in accord with tabulated data, such as tables and charts, approved by a registered professional engineer. This data must be in writing and must include enough explanatory information (including the criteria for selecting a system and the limits on the use of the data) for the user to be able to select an appropriate protective system. At least one copy of the data, which identifies the registered professional engineer who approved it, must be kept at the worksite during construction of the protective system.

10.4.7.1.2. Using a trench box or shield approved by a registered professional engineer or designed in accord with tabulated data approved by a registered professional engineer.

10.4.7.1.3. Designing a protective system requires consideration of many factors, including: soil classification, depth of cut, water content of soil, weather and climate, and other operations in the vicinity. Employers are free to choose the most practical design that will provide the necessary protections. Any system used must meet the required performance criteria.

Figure 10.2. Trench Box/Shields



10.4.7.2. The Excavation standards do not require a protective system when an excavation is made entirely in stable rock or when an excavation is less than 5 feet (1.52 meters) deep and a competent person has examined the ground and found no indication of a potential cave-in.

10.4.7.3. Additional Precautions:

10.4.7.3.1. The Excavation standards require employers to provide support systems, such as shoring, bracing, or underpinning, when necessary to ensure that adjacent structures (including adjoining buildings, walls, sidewalks and pavements) remain stable for the protection of workers. The standards also prohibit excavation below the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to workers unless:

10.4.7.3.1.1. The employer provides a support system, such as underpinning;

10.4.7.3.1.2. The excavation is in stable rock; or A registered professional engineer determines that the structure is far enough away from the excavation that it would not be affected by the excavation activity or that the excavation work will not pose a hazard to workers.

10.4.7.3.2. Excavations that would undermine sidewalks, pavement, and appurtenant structures are prohibited unless the employer provides an appropriately designed support system or another effective method of protecting workers from the possible collapse of those structures.

10.4.7.4. Installing and Removing Protective Systems.

10.4.7.4.1. Supervisors are required to protect workers when installing and removing support systems. For example:

10.4.7.4.1.1. Members of support systems must be securely connected to prevent sliding, falling, kickouts, or predictable failure.

10.4.7.4.1.2. Support systems must be installed and removed in a manner that protects workers from cave-ins and structural collapses and from being struck by members of the support system.

10.4.7.4.1.3. Members of support systems must not be overloaded.

10.4.7.4.1.4. Before temporary removal of individual members, additional precautions are required, such as installing other structural members to carry loads imposed on the support system.

10.4.7.4.1.5. Removal must begin at, and progress from, the bottom of the excavation.

10.4.7.4.1.6. Backfilling must progress together with the removal of support systems from excavations.

10.4.8. **Additional Hazards and Protections.**

10.4.8.1. In addition to cave-ins and related hazards, workers involved in excavation work are exposed to hazards involving falling loads and mobile equipment. To protect workers from these hazards, ITD requires supervisors to take the following precautions.

10.4.8.1.1. Protect workers from excavated or other materials or equipment that could pose a hazard by falling or rolling inside the excavation by placing and keeping such materials or equipment at least 2 feet (0.61 meters) from the edge to keep the materials or equipment from falling or rolling into the excavation.

10.4.8.1.2. Provide a spotter to warn mobile equipment operated adjacent to an excavation, or when such equipment must approach the edge of an excavation, and the operator does not have a clear and direct view of the edge.

10.4.8.1.3. Workers will not stand on or work under loads being handled by lifting or digging equipment.

10.4.8.1.4. Require workers to stand away from vehicles being loaded or unloaded to protect them from being struck by any spillage or falling materials.

10.4.8.2. Water-related Hazards:

10.4.8.2.1. Water in an excavation can undermine the sides of the excavation and make it more difficult for workers to get out of the excavation. In these situations supervisors must take additional precaution prior to allowing workers to enter an excavation where water has accumulated or is accumulating. Precautions can include special support or shield systems to prevent cave-ins, water removal to control the water level, or the use of a safety harness and lifeline.

10.4.8.2.2. If an employer uses water removal equipment to control or prevent water accumulation, the equipment and operations must be monitored by a competent person

to ensure proper use. If excavation work interrupts the natural drainage of surface water, diversion ditches, dikes, or other suitable means to prevent surface water from entering the excavation must be utilized.

10.4.8.2.3. In addition, a competent person must inspect excavations subject to runoffs from heavy rains, and excavations continuously.

10.4.8.3. Atmospheric Hazards:

10.4.8.3.1. Toxic gasses may enter and settle in an excavation from nearby hazardous materials, welding/cutting, naturally occurring gasses from soils or running pumps, heavy equipment, generators or vehicles.

10.4.8.3.2. Atmospheric testing is required before workers enter an excavation greater than 4 feet (1.22 meters) in depth where an oxygen deficiency or a hazardous atmosphere is present or could reasonably be expected.

10.4.8.3.3. When hazardous atmospheres are present, the supervisor will classify the excavation as a permit required confined space. Supervisors may utilize mechanical ventilation to reduce the level of atmospheric contaminants to acceptable levels. In this case atmospheric testing must be conducted as often as necessary to ensure that the atmosphere remains safe. Refer to **chapter 15** of this safety manual for entry procedures.

10.4.8.3.4. If hazardous atmospheric conditions exist or may reasonably be expected to develop in an excavation, the employer must follow permit required confined space requirements of **chapter 15** of this safety manual.

10.4.8.4. Means of Access and Egress:

10.4.8.4.1. Supervisors must provide ladders, steps, ramps, or other safe means of egress for workers working in trench excavations 4 feet (1.22 meters) or deeper. The means of egress must be located so as not to require workers to travel more than 25 feet (7.62 meters) laterally within the trench to exit. All ladders must be within the protected section of the excavation. Workers must not exit the trench box to reach the ladder.

10.4.8.5. Worksite Inspections:

10.4.8.5.1. Supervisors must ensure a competent person inspects all excavations, adjacent areas, and protective systems daily for possible cave-ins, indications of failures in protective systems and equipment, hazardous atmospheres, and other hazardous conditions. Inspections must be done prior to the start of work and as needed throughout the shift. Inspections are also required after natural events, such as rainstorms, or other hazard-increasing occurrences, such as blasting work. If an inspector finds any unsafe conditions during an inspection, the employer must clear

workers from the hazardous area until the necessary safety precautions have been taken.

10.4.9. **Personal Protective Equipment.**

10.4.9.1. Ensure that personnel wear high-visibility or other suitable clothing when exposed to vehicular traffic.

10.4.9.2. All personnel working within the confines of an excavation must wear a hard hat and safety toe shoes/boots.

10.5. Fall Protection.

10.5.1. **General Information.**

10.5.1.1. Worker fall protection requires an in-depth evaluation of risks. Supervisors will:

10.5.1.1.1. Refer to **chapter 1**, Introduction, paragraph 1.5, Job Safety Analysis (JSA) and job safety lesson plan. Note: A JSA is not required if existing guidance covers all safety requirements of an operation.

10.5.1.1.2. Refer to **chapter 6,** Personal Protective Equipment (PPE), for additional guidance on workplace hazards.

10.5.1.2. Additional Information. Competent person means a person who can identify hazardous or dangerous conditions in personal fall arrest systems (PFAS) or any component thereof, and their applications and uses with related fall protection equipment.

10.5.2. **Specific Requirements.** Fall protection is required for workers working in elevated locations on open-sided floors and platforms and near floor and wall openings. Note: Fall protection is not required when working from portable ladders.

10.5.2.1. Fall prevention and protection must be considered for maintenance work or storing of equipment at heights. At the planning and design phase of a project, fall hazards shall be considered and eliminated whenever possible. When elimination or prevention of fall hazards is not feasible, the design must include certified and labeled anchorages.

10.5.2.2. General Industry Operations. Passive or active fall protection shall be provided and worn whenever workers can fall four (4) feet or more. This four (4) foot rule applies to all walking and working surfaces and includes open-sided floors and platforms, wall openings and window wall openings at a stairway landing, floor, platform or balcony with a drop of four (4) feet or more. Refer to paragraph **10.5.3.1** below for types of fall protection.

10.5.2.3. Construction Operations. Fall protection shall be provided when workers can fall six (6) feet or more. This six (6) foot rule applies to all walking and working surfaces, including scaffolding, roofs, open-sided floors and platforms, wall openings and window

wall openings at a stairway landing, floor, platform or balcony with a drop of six (6) feet or more.

10.5.2.3.1. Fall protection is not required for inspections, investigations or assessments of workplace conditions prior to the actual start of construction work or after all construction what has been completed.

10.5.2.3.2. Fall protection is not required on inspections or assessments of flat roofs. However, fall protection is required on inspections or assessments of sloped roofs. Additionally, if an inspection team turns into a working, team, i.e., tightening a screw, making an adjustment on a lightning protection system, etc., the team will don fall protection equipment.

10.5.2.3.3. If the inspection is within six (6) feet of the edge of the roof, fall protection will be required.

10.5.2.4. Erecting or Dismantling Fall Protection. Workers shall be provided with a safe means for erecting or dismantling fall protection systems and features.

10.5.2.5. Dangerous Equipment and Machinery. Regardless of the fall distance, fall protection must be provided when working over dangerous equipment and machinery.

10.5.3. **Types of Fall Protection.**

10.5.3.1. Passive: Passive fall protection, such as guardrails, work stands and platforms nets, ladder cages and other devices can prevent a worker from falling, but are not directly connected to the worker. Nets do not prevent a worker from falling, but does prevent a worker from hitting the next level. If passive fall protection is not feasible, active fall protection is the preferred option.

10.5.3.2. Active: Active fall protection, such as positioning and restraint systems, ladder climbing devices and PFAS, require the worker to wear a harness and attach himself/herself to an anchorage or lifeline. Positioning and restraint systems prevent a worker from falling while a PFAS permits a worker to fall, but limits arresting loads to generally safe levels.

10.5.3.2.1. Positioning and Restraint Systems: Fall restraint systems, also referred to as work positioning systems, are similar to a PFAS; however, fall restraint systems restrict a worker‘s range of movement so the individual cannot fall to the surface below.

10.5.3.2.2. See paragraph **10.5.4.6.** for detailed guidance on PFAS.

10.5.4. **Fall Protection Equipment.**

10.5.4.1. Railings: Refer to **chapter 9**, Walking Surfaces, Guarding Floor and Wall Openings, Fixed Industrial Stairs, and Portable and Fixed Ladders, and 29 CFR 1910.23, Guarding Floor and Wall Opening and Holes, for information on railings.

10.5.4.2. Mobile Work Platforms: Vehicle-mounted elevating and rotating work platforms, manual and self-propelled mobile work platforms or similar equipment may be used to protect workers provided guards, railings, a PFAS or other similar devices are incorporated in the platform design. Refer to **chapter 12**, Mobile Elevating Work Platforms, and 29 CFR 1910.29, Manually Propelled Mobile Ladder Stands and Scaffolds (Towers), for additional information.

10.5.4.3. Ladder Safety Devices: Cages or wells shall be provided on ladders more than 20 feet in length, up to a maximum of 30 feet. Ladders over 30 feet shall be broken into sections with landing platforms spaced no more than 30 feet apart. Ladder safety devices may be used on tower, water tank and chimney ladders in lieu of cages, and no landing platform is required. Ladder safety devices shall: limit worker fall to less than two (2) feet, meet the design requirements of the ladders they serve, permit the worker to ascend or descend without having to continually handle any part of the device and be attached to a frontal centered D-ring or other specifically designed frontal attachment point on a full body harness.

10.5.4.4. Personal Fall Arrest Systems (PFAS): PFAS systems require an anchorage point, connecting means, lanyard and shock absorber. Refer to 29 CFR 1926.502, Fall Protection Systems Criteria and Practices, and 29 CFR 1910.66, Appendix C, Personal Fall Arrest System, for additional information. Refer to 29 CFR 1926.104., Safety Belts, Lifelines, and Lanyards, for additional guidance on basic PFAS guidelines (safety harnesses, lanyards, lifelines). Note: To prevent worker injury or death, PFASs shall not be used without a rescue plan; refer to paragraph **10.5.7.**

10.5.4.4.1. Selection: PFAS shall be selected by a qualified person, match the particular work situation and minimize free fall distance (not to exceed six [6] feet). PFAS equipment shall meet or exceed requirements in ANSI Standard Z359.1., Personal Fall Arrest Systems, Subsystems and Components. Only commercially manufactured fall arrest equipment shall be used.

10.5.4.4.2. PFAS equipment shall have the manufacturer‘s name, identification code and date of manufacture stamped on the equipment or permanently attached tag and shall be marked to indicate compliance with ANSI Z359.1.

10.5.4.4.2.1. The service life of fall protection equipment manufactured of synthetic fiber shall be five (5) years (unless otherwise specified by the manufacturer), or sooner if determined unserviceable per paragraph **10.5.4.4.10.** The five (5) year service life begins once the equipment is put in service, assuming the new unused equipment is stored in a climate-controlled location, i.e., in a plastic bag not exposed to vapors, and in a cool location out of direct sunlight.

10.5.4.4.3. Horizontal lifelines (Skylines), commonly used on bridges shall be designed by a qualified person as defined in 29 CFR 1910.66, Appendix C, Personal Fall Arrest

System, Section 1. The number of workers attached to the lifeline at any time shall not exceed lifeline/anchorage point design limits.

10.5.4.4.4. Full Body Harness:

10.5.4.4.4.1. Only a full body harness shall be used with a PFAS. It shall provide support across the lower chest, over the shoulders and around the thighs and, when properly fitted and used, shall prevent the worker falling out of the harness should a fall occur. While working on or near exposed energized electrical equipment operating at 50 volts or more the safety harness worn over arc flash rated protective clothing shall be arc flash rated and meet ASTM F887-05 standards. Warning: Body belts may not be used.

10.5.4.4.4.2. The lanyard attachment point shall be located in the center of the wearer‘s back near shoulder level or above the wearer's head.

10.5.4.4.4.3. Harness load bearing straps shall have a minimum width of 1-5/8 inch and be finished to prevent fraying.

10.5.4.4.5. Lanyards: Lanyards of synthetic materials shall have free ends lightly seared to prevent unraveling. Knots weaken a lanyard and shall not be used in lanyard end terminations. Lanyards (and shock absorbers) subjected to impact loading from a falling person or weight test shall be removed from service and replaced.

Warning: Wire rope or rope covered wire lanyards, some plastics (such as nylon) and wet lanyards are conductive and shall not be used near electrical hazards.

10.5.4.4.6. Energy (shock) Absorber Components: Each PFAS may include a shock absorber. Shock absorbers shall be designed so activation is obvious, i.e., ripped stitches, telltale strips visible, etc. Shock absorbers with any signs of activation shall be removed from service.

10.5.4.4.7. Anchorage: Anchorages for lifelines and lanyards shall support at least a 5000 pound load for each person connected to the anchorage. Anchorages not meeting this rating can be used as part of a complete PFAS which maintains a safety factor of at least two (2) and is under the supervision of a qualified person. Only one PFAS shall be connected to an anchorage point unless specifically certified for more.

10.5.4.4.8. Connectors: PFAS connectors (hardware used to connect a system together such as a carabiner, D-ring, O-ring, oval ring, snaphook, etc.) shall be drop forged, pressed or formed steel or made of equivalent materials and purchased new with a clean finish, free of rust, scale or foreign matter.

10.5.4.4.8.1. Snaphooks and carabineers shall be self-closing, self-locking, designed to take 2 consecutive and deliberate actions (double locking) to open and load rated for at least 5000 pounds.

10.5.4.4.8.2. Connectors shall withstand a 5000 pound load multiplied by the maximum number of PFAS attached to the connector and shall not be exposed to sharp edges, abrasive surfaces or physical hazards, such as thermal, electrical or chemical sources.

10.5.4.4.9. Fall arrester components: Fall arresters, as in self-retracting lifelines, shall be automatic in their locking (fall stopping) function. Workers shall follow manufacturer instructions to test the locking mechanism after connection to their harness/lanyard. Self-retracting lifeline systems will be positioned over the worker as the worker moves. Pulling on the lifeline cable to provide more slack without moving the overhead carrier (trolley) will result in a pendulum swing should the worker fall. Energy shock absorbers will not be used in conjunction with deceleration devices (self-retracting lifelines).

10.5.4.4.10. PFAS Inspection:

10.5.4.4.10.1. PFAS users shall comply with manufacturer instructions for inspection, maintenance, cleaning and storage. If defects or damage to equipment or inadequate maintenance of equipment is found, the equipment shall be immediately tagged ―unserviceable‖ and removed from service. Unserviceable PFAS will be destroyed to prevent further use.

10.5.4.4.10.2. Workers shall inspect their PFAS prior to the first use of the day and/or shift for mildew, wear, damage and other deterioration.

10.5.4.4.10.3. Supervisors shall ensure all PFAS components receive a thorough inspection at least quarterly. This inspection shall be documented and maintained for at least one year.

10.5.4.4.10.4. Supervisors shall maintain manufacturer instructions and performance testing information for PFASs used by their workers.

10.5.4.4.10.5. PFAS components requiring removal from service:

10.5.4.4.10.5.1. Components with illegible or absent markings.

10.5.4.4.10.5.2. Absence of any element which affects equipment form, fit or function.

10.5.4.4.10.5.3. Defective or damaged hardware elements including distorted hooks or faulty hook springs, tongues unfitted to shoulder buckles, loose or damaged mountings, non-functioning parts, cracks, sharp edges, deformation, corrosion, chemical attack, excessive heating, alteration, deterioration, contact with acids or other corrosives and excessive wear.

10.5.4.4.10.5.4. Defects or damage to straps or ropes including fraying, unsplicing, unlaying, kinking, knotting, roping, broken or pulled stitches,

excessive elongation, chemical attack, excessive soiling, cuts, tears, abrasion, mold, undue stretching, alteration, needed or excessive lubrication, excessive aging, contact with heat, fire or corrosives, internal or external deterioration and excessive wear.

10.5.4.4.10.5.5. Lanyards after an impact load and shock absorbers with any signs of activation.

10.5.4.4.11. PFAS Use, Maintenance, and Storage Requirements:

10.5.4.4.11.1. Equipment shall be stored and maintained according to the manufacturer instructions.

10.5.4.4.11.2. Equipment shall be stored to preclude damage from environmental factors such as heat, light, excessive moisture, dirt, oil, chemicals, and their vapors, or other degrading elements.

10.5.4.4.11.3. Rope, synthetic materials, and rope-covered lanyards shall not be used while welding, cutting, or in areas with sharp edges, open flames, or excessive heat.

10.5.4.4.11.4 Lanyards, connectors, and lifelines subject to damage by work operations such as welding, chemical cleaning, and sandblasting, shall be protected or other securing systems used.

10.5.4.4.11.5. Lanyards shall be kept as short as practical to minimize free fall distance, shall not permit a vertical fall of more than six (6) feet as specified in paragraph 10.5.2, nor allow the worker to contact any lower level or obstruction. Lanyards shall not be attached to a dropline, lifeline, or fixed anchorage point in a manner that reduces lanyard strength.

10.5.4.4.11.6. It is common practice to interchange lanyards, connectors, lifelines, deceleration devices and body harnesses; however, components from different manufacturers may not be safely interchangeable. Always check with the manufacturer(s) before mixing components.

10.5.4.4.11.7. Only use PFAS components for their designed purposes.

10.5.4.4.11.8. PFAS components subjected to impact loading shall be immediately removed from service and replaced.

10.5.4.4.11.9. Supervisors shall ensure workers using a PFAS can be properly rescued or can rescue themselves should a fall occur. Availability of rescue personnel, ladders or other rescue equipment shall be determined prior to using a fall arrest system. Warning: Hanging in a harness for an extended period of time can be fatal. IAW ANSI Z359.4, Safety Requirements for Assisted-Rescue and

Self-Rescue Systems, Subsystems and Components, prompt rescue means getting to the subject within six (6) minutes after an accidental fall.

10.5.4.4.12. Electricians: Fall protection equipment for electricians shall be Arc Thermal Performance Value (ATPV) rated IAW 1910.263(I)(8)(v) and Appendix E.

10.5.5. **Supervisor, Qualified Person, and Competent Person Fall Protection Duties and Responsibilities.** A supervisor, who is designated in writing, shall be responsible for procurement of fall protection/fall arrest systems required by the organization or shop. The supervisor shall be familiar with the shop‘s typical work assignments and fall protection/fall arrest systems required for each operation. The supervisor shall ensure each worker/qualified person/competent person using a fall protection/fall arrest system is trained and evaluated on proper use, application and inspection of fall protection/fall arrest systems.

10.5.5.1. The supervisor shall:

10.5.5.1.1. Conduct JSA, as required.

10.5.5.1.2. Prepare, review, approve and modify plans for fall protection and prevention, rescue and evacuation and training lessons.

10.5.5.1.3. Ensure initial and recurring training and training evaluations are provided to shop personnel on fall protection/fall arrest systems prior to initial use. Refer to paragraph **10.5.6** below for additional guidance.

10.5.5.1.4. Ensure appropriate design, selection, certification, evaluation and analysis of fall protection/fall arrest systems and equipment.

10.5.5.1.5. Conduct fall protection/fall arrest system inspections and support accident investigations.

10.5.5.2. A qualified person, typically an engineer, shall: identify and certify anchorage points on facilities and structures. Help develop and evaluate fall protection plans. Assist supervisors and competent persons in selecting fall protection systems.

10.5.5.3. The competent person, typically an experienced worker, shall:

10.5.5.3.1. Assist supervisors and qualified persons in determining feasibility and safety of fall protection for workers and selecting appropriate fall protection systems.

10.5.5.3.2. Perform on site observations of job work conditions, use of fall protection systems and correct application of the fall protection plan.

10.5.5.3.3. Identify hazardous conditions and suspend work tasks until hazards are corrected.

10.5.5.3.4. Inspect PFAS equipment to determine if components subjected to impact loading are undamaged. If damaged, remove and replace.

10.5.6. **Training.** Workers/competent persons shall be trained and evaluated prior to using any PFAS. Training shall include: methods of use, application, inspection and storage, as well as any manufacturer‘s recommendations; application limits, proper anchoring and tie-off techniques, estimation of free fall, deceleration and total fall distance to prevent striking a lower level; applicable fall protection, fall prevention, rescue and evacuation plans. Recurring training shall be conducted annually, when work conditions change, or new fall arrest systems are used and documented on TalentEd or equivalent.

10.5.7. **Rescue Plan.** Each fall protection plan shall include a rescue plan. PFAS use shall be suspended if a means to rescue a fallen worker is not available.

10.5.7.1. Self-rescue by a fallen worker may be possible, depending on location and work conditions. However, the supervisor shall ensure a rescue plan is in place to rescue workers should they be injured or unable to self-rescue.

10.5.7.2. Workers suspended in a full body harness often lose consciousness after a fall. This is caused by restrictions in blood flow to the extremities caused by the harness. The rescue plan must ensure a rescue can be affected very quickly to prevent permanent injury or death.

10.5.7.3. When potential for serious injury exists due to a fall and no threat requires immediate movement of the fallen worker, the worker should remain in place and encouraged to remain still while emergency services personnel are called to assist.

10.6. Hazardous Material Incident Spills Response & Cleanup.

10.6.1. Hazardous Material/Incidents or Spills: Hazardous materials require special procedures, as outlined in the Emergency Response Guidebook (ERG) and ITD Hazardous Materials Coordinator’s Handbook.

10.6.2. Emergency Response Procedures: There are many situations when Operations staff may be exposed to situations requiring emergency action. The most common emergency situations Operations staff may encounter are vehicle collisions and hazardous material spills. ITD offers training to Operations staff on Incident Response and Haz-Mat awareness that provide basic understanding of how to respond to these situations. If you come upon a hazardous material spill, do the following:

10.6.2.1. Resist rushing in.

10.6.2.2. Keep a safe distance.

10.6.2.2.1. Stay clear of vapor, fumes, smoke, and spills.

10.6.2.3. Secure the scene.

10.6.2.3.1. Isolate the area and protect yourself and others**,** if possible.

10.6.2.4. Identify the hazard from a safe distance (if it’s possible to do so safely), using the placard and ERG.

10.6.2.4.1. If you're unable to identify the load, or, for mixed loads, use ERG Guide page 111.

10.6.2.5. Assess the situation. Note highway/route and mile marker for State Com.

10.6.2.5.1. Is there a fire, spill, or a leak?

10.6.2.5.2. What is the weather condition?

10.6.2.5.3. What is the terrain like?

10.6.2.5.4. Who/what is at risk: people, property, or the environment?

10.6.2.5.5. What actions should be taken—evacuation, shelter in place, dike?

10.6.2.5. Obtain Help.

10.6.2.5.1. Notify the local authorities (city or county) by dialing 911 where available. Notify the State Communication Center at 1-800-632-8000 or (208) 846-7610 for assistance.

10.6.2.6. **Above all**, do not assume gases or vapors are harmless because of a lack of a smell – odorless gases and vapors may be harmful.

10.6.3. In-House Emergency Spill Procedures.

10.6.3.1. Cordon off the incident area and establish a safe zone. If hazardous materials are suspected, evacuate all persons from the immediate area and remain upwind of the incident area. Call 1-800-632-8000 or 1 (208) 846-7610 for recommended procedures.

10.6.3.2. Enter the incident area only when properly trained and equipped with appropriate protective clothing and equipment.

10.6.3.3 Render first aid to victims if substance is known and it is safe for responders or after decontamination is completed; be sure to notify medical personnel if any exposure to a hazardous material is suspected.

10.6.3.4 Establish an Incident Command response structure and serve as an on-scene communication point.

10.6.3.5. Brief arriving response team leaders, incident commanders and additional responders.

10.7. Vegetation Control.

10.7.1. **General Information.** This chapter applies to any vehicle or equipment used to apply and or provide traffic control for any pesticide applications and seeding projects.

10.7.1.1. Label is law.

10.7.1.2. Pesticide applications shall be performed according to *Federal Label restrictions, Idaho State Department of Agriculture (ISDA) regulations and department policies.*

10.7.1.3. A State of Idaho Professional Applicator License with a minimum categories of Law and Safety and Right of Way is required to direct or perform any pesticide application on the roadway and within ITD property lines.

10.7.1.4. Any non-licensed employee who assists in mixing or loading of chemicals shall have yearly, ISDA approved Mixer/Loader training. A Mixer/Loader Certificate of Training (ISDA form) shall be kept on record and updated yearly.

10.7.1.5. Any employee that works with or around pesticides including application and mixing/loading shall be subject to ITD Biological Monitoring program.

10.7.1.6. A non-licensed employee may apply pesticides as long as an appropriately licensed employee is within line of sight of the work being performed.

10.7.1.7. Eye wash facilities shall be accessible for all applicators. A combination eye wash/vehicle wash hose and fresh water tank shall be mounted on designated spray equipment.

10.7.1.8. At a minimum, Label required PPE shall be worn for any activities involving pesticides.

10.7.1.9. A current Chemical label and SDS sheets shall be kept with all chemicals that are being used or stored in designated facilities and vehicles.

10.7.2. **Vehicle-mounted and Manual Spray Equipment.**

10.7.2.1. Maintenance and Calibration:

10.7.2.1.1. All application equipment shall be calibrated according to the vehicle/equipment operations manual. This shall be performed before each season or after any maintenance or modifications have been made. Backpacks shall be calibrated prior to every application.

10.7.2.1.2. Equipment shall be maintained to ensure proper application pressure, volume and drift requirements.

10.7.2.2. Motorized Equipment Operation:

10.7.2.2.1. A licensed applicator must be present and in command of any vehicle performing pesticide applications.

10.7.2.2.2. Any employee may drive or move spray equipment as long as a licensed applicator is present or if the master spray module is not powered up and no switches or dials are moved.

10.7.2.2.3. A pre-trip inspection of the spray components and switch positions must be performed before the spray equipment is powered up, started or moved any distance.

10.7.2.3. Manual Equipment Operation:

10.7.2.3.1. Any application in areas occupied by the general public or within 10 feet of a public or private property line shall be under direct, visual supervision of the licensed applicator.

10.7.2.3.2. Pesticide applications to ITD yards, pits or facilities may be performed by any ITD employee as long as the Label requirements are observed and the chemical used is provided by a licensed applicator.

10.7.2.3.3. Non-licensed applicators shall contact a licensed applicator in their district before any pesticide applications on ITD property.

10.7.2.4. Equipment Cleaning:

10.7.2.4.1. Equipment shall be washed in an approved area before any contact is made by employee and the vehicle, including loading and maintenance to avoid exposure. An exception will be made if the employee is wearing proper PPE as described by the chemical label.

10.7.3. **Pesticide Storage and Disposal.**

10.7.3.1. Pesticide Storage Facilities:

10.7.3.1.1. Long term storage facilities must have all appropriate signs, spill containment and ventilation.

10.7.3.1.2. Any employee that enters the storage facility must be accompanied by a designated, properly licensed employee, according to Federal and State guidelines.

10.7.3.1.3. Temporary storage of small quantities of pesticides may be kept in an approved, secure area or vehicle.

10.7.3.1.4. Any chemical in temporary storage will be returned to the main storage area as soon as the application is completed or at the end of season.

10.7.3.1.5. All used chemical containers must be kept in an approved, long tern storage area until it has been properly triple rinsed and disposed of according to the label.

10.7.4. **Traffic Control.**

10.7.4.1. Any operation performed on ITD highway, shoulders or right of ways shall conform to applicable MUTCD standards and specifications.

10.7.4.2. Shadow vehicles should be equipped with an in cab filter and follow at an appropriate distance from the spray vehicle.

10.7.4.2.1. Shadow vehicles shall be properly cleaned at least at the end of shift or as needed to avoid contact exposure.

10.7.5. **Seeding.**

10.7.5.1. Reseeding operations including broadcast, drilled, or hydro seeding, shall use approved certified weed free seed mixtures, mulch and fertilizer.

10.7.5.2. Seeding equipment shall be cleaned and inspected when moving from one project to another to avoid possible cross contamination or unwanted species introduction into other areas.

10.7.5.3. Seed mixes should be created with consideration of geographic location, annual rainfall, average temperature, and any other factors that will help ensure success of reseeding.

10.7.5.4. Sturdy boots, safety glasses, long pants, and long sleeve shirts should be used in addition to any required PPE for seeding operations.

10.7.5.5. Personnel involved with seeding operations shall be properly training in the use and operation of the equipment used for seeding projects.

10.8. Chainsaws:

The chainsaw is one of the most efficient and productive portable power tools used in tree and brush removal. It can also be one of the most dangerous. Employees must be trained before operating them. Saws must be kept in good working condition and maintained according to manufacturer's instructions. These precautions shall be observed by all users of chain saws:

10.8.1. Do not operate a chain saw when fatigued.

10.8.2. When operating chainsaws employees are required to wear safety toe footwear, snug-fitting clothing, protective gloves, eye and face protection, hearing protection, hard hat (when tree felling, brushing or limb shredding occurs in the vicinity) and chaps/leggings. Refer to **chapter 6,** of this manual for further guidance on Personal Protective Equipment.

10.8.3. Use caution when handling fuel. Allow the engine to cool before refueling. Move the chainsaw at least 10 feet from the fueling point before starting the engine.

10.8.4. Do not allow other persons near the chainsaw when starting or cutting. Keep bystanders and animals out of the work area.

10.8.5. Ensure the saw chain is not contacting anything before starting the engine.

10.8.6. Start chainsaw on ground with one foot on rear handle, one hand firmly gripping saw grip bar, and one hand pulling starter cord. Maintain secure footing. Saws weighing less than 15 pounds may be drop started.

10.8.7. Use extreme caution when felling trees. Do not start cutting until you have a clear work area, secure footing and a planned retreat path from the falling tree or limb, etc. Be

aware of surroundings such as structures, power lines, roads, vehicles and personnel. Drop trees and limbs away from these objects whenever possible. Keep in mind trees tend to roll once they land and anticipate where they will come to rest. Also be aware trees may hang up on nearby trees/branches.

10.8.8. Hold the chainsaw firmly with both hands when the engine is running. Use a firm grip with thumbs and fingers encircling the chainsaw handles.

10.8.9. Keep all parts of the body away from the saw chain when the engine is running.

10.8.10. Carry the chainsaw with the engine stopped, the guide bar and saw chain to the rear and the muffler away from the body. When moving from cutting spot to cutting spot the engine may be left running if the chain break is engaged.

10.8.11. Do not operate a chainsaw that is damaged, improperly adjusted or not completely and securely assembled. Ensure the saw chain stops moving when the throttle control trigger is released. Replace the guide bar whenever the guide bar is worn to a point where the chain will tilt sideways. Keep the chain sharp. A dull chain requires extra pressure by the operator, lessening control over the saw.

10.8.12. Shut off the chain saw engine before setting it down.

10.8.13. Use extreme caution when cutting small size brush and saplings because slender material may catch the saw chain and be whipped toward you or pull you off balance.

10.8.14. When cutting a limb under tension, be alert for spring back so you will not be struck when the tension in the wood fibers is released.

10.8.15. Keep saw handles dry, clean and free of oil or fuel mixture.

10.8.16. Operate the chainsaw only in well-ventilated areas.

10.8.17. Do not operate a chainsaw while in a tree unless you have been specifically trained for the operation.

10.8.18. Ensure all chainsaw service, other than items listed in the owner‘s manual maintenance instructions, is performed by competent chainsaw service personnel. For example, if improper tools are used to remove the flywheel or to hold the flywheel to remove the clutch, structural damage to the flywheel could occur and subsequently cause the flywheel to burst.

10.8.19. Guard against kickback. Kickback is the upward motion of the guide bar that occurs when the saw chain at the nose of the guide bar contacts an object. Kickback can lead to loss of control of the chainsaw. To reduce kickback:

10.8.19.1. Hold the chainsaw firmly with both hands.

10.8.19.2. Do not overreach.

10.8.19.3. Do not let the nose of the guide bar contact a log, branch, ground or any other obstruction.

10.8.19.4. Cut at high engine speeds.

10.8.19.5. Do not cut above shoulder height.

10.8.19.6. Follow manufacturer‘s maintenance instructions when sharpening or performing maintenance on the chainsaw.

10.8.19.7. Use devices that reduce kickback hazards, such as low-kickback chain, guide bar nose guards, chain brakes and special guide bars.

10.8.20. Use the appropriate chain/guide bar scabbard when transporting the chainsaw.

Chapter 11 – Flagger/Traffic Control Program

11.1. Legal Authority.

11.1.1. Idaho code 40-310(9)

11.1.2. Idaho Code 40-310-(10)

11.1.3. Idaho Code 40-505

11.1.4. Administrative Policy 5530

11.1.5. The Work Zone Safety and Mobility program

11.1.6. The MUTCD as approved by the Idaho Transportation Board

11.2. Purpose.

11.2.1. This chapter defines the use of Temporary Traffic Control and the certification of Temporary Traffic Control training programs on the state highway system.

11.3. Responsibilities and Duties.

11.3.1. The primary function of Temporary Traffic Control procedures is to move vehicles and pedestrians safely and expeditiously through work zones while protecting onsite workers and equipment.

11.3.2. The Traffic Control Oversight Committee (TCOC) has overall purview of work zone Temporary Traffic Control policies on the State Highway System.

11.3.3. The TCOC monitors the flagger certification program and all policies related to it to ensure that safety requirements are met in accordance with Idaho State law and the Manual on Uniform Traffic Control Devices (MUTCD).

11.3.4. **The TCOC:**

11.3.4.1. Has oversight over the training curriculum for the Flagger and Traffic Control Supervisor certification programs in Idaho

11.3.4.2. Assists in the administration of the flagging and TCS programs by supervising and coordinating the development and updates of training materials and the tracking of flagging and related work zone traffic control courses

11.3.4.3. Ensures that adequate equipment and facilities are available and monitors the teaching credentials of all ITD instructors

11.3.4.4. Implements, monitors, and enforces the appropriate memorandums of understanding and reciprocity agreements with other states and agencies

11.3.4.5. Publish standards and procedures for traffic control by flaggers

11.4. Standard Program and Reciprocity.

11.4.1. Programs have been established for flagger instructors that ensures instructors are qualified to teach and that they deliver the appropriate training and materials to the students. ITD utilizes nationally recognized organizations such as the American Traffic Safety Services Association (ATSSA), Evergreen Safety Council. By adopting these programs, ITD acknowledges that the minimum ethics, standards, and prerequisites of the organization will be followed by ITD unless otherwise indicated in writing. The organization in turn must support Idaho's policies, rules, regulations, and laws.

11.4.2. Currently, Idaho has reciprocity with the states of Oregon, Washington, Montana, and Utah and hence will accept valid flagger cards from recognized instruction programs in these states. ITD will also accept the Evergreen Safety Council and ATSSA flagger cards issued in other states that can be verified by contacting the organizations. All cards must be accompanied with appropriate photo identification.

11.4.3. The Coordinator of Veterans' Education/Proprietary School Approval/SPRE person at the State Department of Education will advise ITD in writing of all proprietary schools authorized to teach Temporary Traffic Control to certify flaggers in Idaho. ITD will also assist the vocational schools in establishing flagger training programs that will provide adequate training opportunities to the public so that qualified flaggers are available to work on the State Highway System.

11.5. Flagging Instructors.

11.5.1. Flagging instructors must be trained by an authorized provider approved by ITD to teach and issue flagger cards. To become certified Flagging Instructors must:

11.5.1.1. Have a current flagger card from an ITD approved or recognized certification program

11.5.1.2. Have successfully completed a Traffic Control Supervisor (TCS) course, or 16 hours of Traffic Control Instruction, or have the necessary flagger experience (verified 1000 hours)

11.5.1.3. Sign an agreement with the entity providing the instructor training & remain in compliance with that agreement and the multi state reciprocity agreement

11.5.2. ITD recognizes Flagger certification cards when taught using ITD approved courses by ITD approved instructors. Currently, ITD has approved the Flagger training courses from the Evergreen Safety Council (ESC) and ATSSA. ITD recognizes only those instructors who have the proper credentials and who teach the Evergreen Safety Council (ESC) or ATSSA course or have had their curriculum approved by the TCOC.

11.5.3. The TCOC consists of representatives from Traffic, Training and Development, Construction, Maintenance, and Employee Safety Risk Manager (ESRM) and shall review and approve all course curriculums for anyone teaching in Idaho that uses a curriculum other

than the official ITD standard flagger certification program. No flaggers will be allowed to work on the State Highway System until the State Traffic Engineer has given approval in writing of their training program.

11.5.4. ITD participates in a multi-state Flagger Reciprocity Agreement with the State Departments of Transportation (DOT's) of Washington, Oregon, and Montana, and a separate Flagger Reciprocity agreement between ITD and the Utah DOT. Flagger certifications from courses approved by these state DOT's allows flaggers certified in those states to cross state lines for employment and work in Idaho.

11.5.5. ITD will recognize the instructors of states for which ITD has reciprocity with only for training conducted **within** those states by the state-sanctioned programs. Other states' instructors are not allowed to cross state lines and teach within Idaho unless specifically contracted with by ITD, or they are affiliated with the State Division of Vocational Education or they are an approved, registered proprietary schools in Idaho and have had their curriculum approved by the TCOC.

11.5.6. Likewise, flagger instructors trained in Idaho must follow the rules and procedures for teaching in other states. ITD will recognize their flagging cards and courses if they still conform to the ITD minimum standards and comply with the host state's teaching requirements. ITD will not encourage programs or teaching that violates another state's rules, regulations, or laws no matter what credentials they may have.

11.5.7. Flagger instructors who do not follow the appropriate curriculums, procedures, rules, regulations, and laws will not be recognized to operate on the State Highway System in Idaho nor will the flaggers they train. In addition, ITD will pursue disciplinary action against them.

11.5.8. ITD flagger instructors or master flagger instructors (i.e., train other instructors) will be trained to ensure that they have the proper knowledge and credentials to teach others. ITD personnel who are trained as master flaggers or flagger instructors will only train other flagger instructors and flaggers who will work within ITD, the vocational-technical schools, and local government agencies. ITD instructors may, at the discretion of the District Engineer, also provide instruction for special events such as parades, bike races, etc. ITD personnel should avoid competing with other flagger instruction programs, especially when personal gain will be realized.

11.6. Flaggers.

11.6.1. All flaggers on the State Highway System will be duly trained and certified by a recognized instructor in good standing.

11.6.2. **All Certified Flaggers Will:**

11.6.2.1. Complete an accredited course with a minimum length of 4 hours on flagging and traffic control that includes coverage of Part VI of the MUTCD

11.6.2.2. Pass a written exam (open book) with a score of 80% or better

11.6.2.3. Carry a government-issued photo ID for validation of the card

11.6.2.4. Be issued a flagging manual or handbook for future reference

11.6.2.5. Be re-certified at an interval not to exceed three (3) years from the date of original certification

11.6.2.6. Have in their possession the flagger certification card proving they are approved to flag on the State Highway System as well as photo identification and will produce these documents when requested by ITD personnel supervising or inspecting their activities. Cards will indicate where they were issued and by what organization.

11.6.2.7. Be a minimum of 18 years of age

11.6.3. Flaggers will follow all appropriate requirements and procedures in the conduct of their duties.

11.7. Unapproved Flaggers and Flagger Instruction.

11.7.1. Flaggers who have inadequate flagging credentials shall not be allowed to flag on the State Highway System.

11.7.2. The following actions should be taken upon determining that unapproved flagging instruction may be occurring in Idaho:

11.7.2.1. Gather as much information on the instructor and course as you can, i.e., name, address, phone number, dates course taught, place, copy of advertisement, etc.

11.7.2.2. Inform TCOC via ITD Design/Traffic Services at:

11.7.2.2.1. ITD Design/Traffic Services
PO Box 7129
Boise ID 83707-1129

Phone (208) 334-8558

11.7.3. The TCOC will then inform the District Engineer, District Safety Compliance Officers and Design/Construction Engineers in the affected areas. The TCOC will then take the steps necessary to coordinate with the appropriate organizations or states with which Idaho has reciprocity to ensure that the violations cease and sanctions are effected if necessary.

11.8. Online Classes Certification/Recertification.

11.8.1. ITD does not recognize on-line Flagging-Temporary Traffic Control courses for certification or recertification of flaggers working in the state of Idaho.

11.8.2. ITD does not recognize on-line Traffic Control Supervisor courses for certification or recertification of traffic control supervisors working in the state of Idaho.

11.9. Project Inspector Responsibilities.

11.9.1. Verify that all flaggers have a current flagging card from a flagging course accredited in Idaho (for out of state cards see section 11.9.3 below) (for certifications from an online source see section 11.8 above) and a government issued photo ID in their possession on their first day on the project.

11.9.1.2. Perform random checks for proper credentials on flaggers throughout the life of the project.

11.9.2. Verify that traffic control supervisors have a current Traffic Control Supervisor's card from a flagging course accredited in Idaho and a government issued photo ID in their possession on their first day on the project.

11.9.2.1. Perform random checks for proper credentials on traffic control supervisors throughout the life of the project.

11.9.3. Flagging Cards & Traffic Control Supervisor's Cards Issued from Programs Outside of Idaho.

11.9.3.1. The following conditions must be met for a flagger or TCS with an out of state certification to be allowed to work as a traffic control professional in the state of Idaho:

11.9.3.1.1. Verify that the issuing state has an ongoing reciprocity agreement with the state of Idaho.

11.9.3.1.2. Verify that the card was issued from an ITD approved program (ATSSA or Evergreen Safety Council).

11.9.3.1.3. Verify that the flagger/TCS has a government issued photo ID in their possession (or that their flagging/TCS card has a picture on it).

11.9.3.2. If either of the first two conditions can't be verified on site; contact their employer, your supervisor & the District Safety Officer for further review.

11.10. Temporary and Special Event Flagging Instruction.

11.10.1. Occasionally, special events occur where flaggers would be used for a specialized activity or very short-term situation. In these situations, the flaggers will be duly trained and certified to work on the state highway system and will meet the same requirements listed above for certified flaggers.

Chapter 12 – Equipment Operations Safety

12.1. Safety Signs and Signals.

12.1.1. ITD vehicles will not be used in maintenance or construction work areas on the highways unless proper warning signs have been placed on the right-of-way to warn traffic that the equipment is in the roadway. This regulation also applies to flaggers when they are necessary. Flaggers shall be trained in an ITD approved training course.

12.1.2. All temporary traffic control shall meet the current specifications as outlined in the Manual on Uniform Traffic Control Devices. For more information on ITD Traffic Control Requirements go to Chapter 11 Traffic Control in this Safety Manual.

12.2. General Safety Precautions for All ITD Equipment.

12.2.1. Always:

12.2.1.1. Make sure all doors are closed and securely fastened.

12.2.1.2. Be sure that all persons are clear of all moving parts.

12.2.1.3. Set parking brake, lower hydraulics, stop engine, and remove keys before working on or around equipment unless it is absolutely necessary to have the engine running while diagnostics or maintenance is taking place. On equipment that is push button start and does not require a key, shut off and remove the master power key.

12.2.1.4. Observe all gauges while operating equipment.

12.2.1.5. Set parking brake before leaving cab.

12.2.1.6. Follow the lock out tag out procedures prior to servicing equipment.

12.2.1.7. Keep hands, feet, hair, and loose clothing away from all moving parts when working on or around running equipment.

12.2.1.8. Inspect the cooling system with the engine stopped.

12.2.1.9. Remove radiator pressure cap slowly.

12.2.1.10. Observe caution when working around hot components.

12.2.1.11. Make all checks, adjustments, lubrication, and maintenance with engine stopped and parking brake applied unless otherwise specified.

12.2.1.12. Ensure operators and all passengers fasten their safety belts prior to setting the vehicle in motion and remain belted until the vehicle is stopped.

12.2.2. Never:

12.2.2.1. Operate equipment until having been familiarized with all safety precautions, functions of all gauges and controls, and operate of the equipment as outlined in the

operating instructions and in compliance with ITD Equipment Operator Training Program (most current EOTP) memo.

12.2.2.2. Allow anyone to operate the equipment without proper training.

12.2.2.3. Operate equipment around buildings, vehicles, or people unless absolutely necessary.

12.2.2.4. Operate without safety devices in place.

12.2.2.5. Operate engine in a closed or poorly ventilated building.

12.2.2.6. Add fuel to a hot or running engine.

12.2.2.7. Smoke near or around any battery.

12.2.2.8. Let battery electrolytic solution contact skin or eyes.

12.2.2.9. Remove parking brake without having primary engine running.

12.2.2.10. Rely on hydraulic lift mechanism to retain cab, bed, bucket, plow or other hydraulic implements. Always secure hydraulic implements with proper blocks or support mechanisms.

12.2.3. Other Key Points.

12.2.3.1. Fueling. Shut off the engine while fueling. No smoking. Be aware of slip and trip hazards. Beware of spills and splash-back. Return hose to its proper storage position when fueling is completed.

12.2.3.2. Lockout. Lockout procedures must be followed during mechanical service, repairs or inspection for the protection of employees and equipment. For more information on ITDs Lockout Tagout program refer to **chapter 13** Control of Hazardous Energy in this Safety Manual.

12.2.3.3. When operators are assisting mechanics to repair machines, clear communications must be established prior to starting the tasks. The operator and the mechanic must each know who will be responsible for:

12.2.3.3.1. Starting or moving a machine.

12.2.3.3.2. Ensuring that anyone involved is in a clear and safe position.

12.2.3.3.3. Directing the movement of the machine.

12.2.3.3.4. Ensuring that it is safe to resume working and that all guards are in place.

12.2.3.4. The operator must have a clear understanding of what is to be done and follow the specific lockout instructions and instructions given by the mechanic responsible for performing the job.

12.2.4. Safe Driving Practices.

12.2.4.1. All ITD employees holding CDLs that are required to drive state vehicles and/ or equipment as a part of their job shall attend a basic Defensive Driving Course as soon as possible after hire and every 3 years thereafter.

12.2.4.2. Seat belts shall be worn at all times in ITD vehicles & equipment.

12.2.4.3. The use of handheld electronic devices such as mobile phones by the operator is prohibited (For more information on ITD's electronic device policies; refer to board policy 5558).

12.2.4.4. All ITD vehicles are Non Smoking (For more information on ITD's smoking policies. (refer to board policy 5508).

12.2.4.5. It the driver's responsibility to know and follow all applicable state and federal laws governing vehicle operations.

12.2.4.6. Make certain that your vehicle is loaded properly and the load is secured before moving (remember the driver is responsible for the load). The load shall be arranged so that no debris or aggregates will fall from the vehicle and secured in accordance with the North American Cargo Securement Standard as well as local laws. Do not overload your truck.

12.2.4.7. **The driver is responsible for paying any fine imposed upon him/her if found guilty of speeding, overloading or other traffic violations.**

12.2.4.8. Motor vehicles should not be left unattended unless the ignition is turned off and the brakes are effectively set.

12.2.4.9. If the vehicle is left on an incline, turn the wheels into the curb or shoulder of the road.

12.2.4.10. When parking or leaving equipment, the operator must ensure that equipment is off the roadway and poses the least possible traffic hazard. When leaving equipment along the roadway overnight, the equipment should be parked outside of the clear zone or as far from the traveled way as practicable.

12.3. Dump Truck.

12.3.1. **Note:** Only employees who have successfully completed the Dump Truck training (including pre & post OJT hours) are allowed to operate this equipment without direct supervision refer to the most current EOTP memo.

12.3.2. Driver's Responsibility. The driver is responsible for the following elements for safe vehicle operation and driving techniques listed above as well as the job specific items listed below.

12.3.3. Checking the Vehicle Before Operating.

12.3.3.1. Perform a walk around inspection as described in ITD form 1422 and Chapter 2 of the Operations Manual.

12.3.3.2. Check safety equipment before taking the vehicle out. See that you have a first-aid kit, a flashlight in good operating condition, flags, flares, a tow cable, shovel, a fire extinguisher in good operating condition and tire chains (if needed).

12.3.3.3. Any shortages or defective equipment should be reported to your supervisor as soon as possible.

12.3.4. Dump Truck Operations. Most common dump truck accidents on jobsites could be prevented by a little planning and situational awareness. Typical jobsite accidents involve backing into or over something, trucks hitting an overhead utility, or trucks tipping over onto their side. By following policies, procedures, and safe practices, these types of accidents can be avoided.

12.3.4.1. Safe Operating Procedures for Dump Trucks.

12.3.4.1.1. Follow all manufacturer recommendations concerning safe operation and maintenance of equipment.

12.3.4.1.2. Only drivers who are properly and thoroughly trained in the operation of the dump truck should operate the vehicle.

12.3.4.1.3. Conduct a “CDL Walk Around Inspection of the truck before operating.

12.3.4.1.4. Note any damage or deficiencies on the truck and report them to your supervisor.

12.3.4.1.5. Confirm that the truck is safe for you to operate.

12.3.4.1.6. Check the area around the truck before placing it into motion.

12.3.4.1.7. Always face the truck and maintain 3 points of contact when getting in and out of the truck.

12.3.4.2. Dumping.

12.3.4.2.1. Check area around and above the truck for any obstructions before raising the dump box.

12.3.4.2.2. Remember to look overhead before raising your bed.

12.3.4.2.3. Drivers should be trained to recognize areas hazardous to dumping, such as soft or uneven surfaces and inadequately compacted fill (when in doubt about hazards in the area discuss the operation with your team/supervisor).

12.3.4.2.4. Before dumping, drivers should make sure that the tailgate is unlocked and the truck is on reasonably level surface.

12.3.4.2.5. Before spreading material by dumping from a moving truck, make sure that the entire length of travel is reasonably level and free from obstructions (wires, tree branches, signs etc.).

12.3.4.2.6. Use a spotter (ground person) when available.

12.3.4.2.7. Alert workers on the ground to stay a safe distance from the truck prior to dumping.

112.3.4.8. After lowering the bed from dumping, get out and inspect your vehicle for debris caught in the tailgate, on fenders, tires or bumpers. Remove the debris utilizing a broom, bar or shovel prior to departing the area.

WARNING

Never use your hands or fingers to remove debris from between the tailgate and the bed. This could result in a crushing injury or amputation of the appendage.

12.3.4.3. Maintenance.

12.3.4.3.1. Check tire pressure daily; tire pressure should be equal on both sides of the truck.

12.3.4.3.2. Inspect the truck daily and lubricate as directed in the Chapter 2 Operations Manual

12.3.4.3.3. Inspect suspension system under a load to ensure that it is working properly

12.3.4.3.4. Inspect hydraulic systems regularly (this would include: cylinders, hoses, valve bodies & the pump). Worn or damaged components should be reported to the supervisor or shop superintendent.

12.3.4.3.5. Never work under any raised hydraulic equipment unless that equipment is adequately supported by a prop rod or cribbing. Do not rely on the truck's hydraulic system to hold the box up while working on it.

12.4. Transports.

12.4.1. Driver's Responsibility. In addition to the safety requirements listed in the dump truck section of this chapter the transport driver is also responsible for the following job specific items below:

12.4.2. Proper trailer operation (loading/unloading, tracking etc.).

12.4.3 Proper load placement to meet axel weights & height limitations.

12.4.4. Proper tie down procedure and devices (chains, binders etc.).

12.4.5 Oversize route requirements.

12.4.6. Oversize weight restrictions.

12.4.7. Overhead clearances.

12.4.8. Proper and safe operation of the equipment to be loaded.

NOTE

If the transport driver is not trained and qualified to operate the equipment to be loaded, obtain assistance from qualified operators at the local shed.

12.5. Snow Removal Equipment/Operations.

12.5.1. When driving snow removal equipment, extra precautions must be taken when passing or being overtaken by other vehicles to avoid throwing large chunks of snow through windshields or dangerously obscuring the vision of other drivers.

12.5.2. Speed of snowplows shall be greatly reduced (even to the point of stopping) for the safety of other traffic. A sudden swerving of snow removal equipment, when striking hard frozen masses of ice or snow, has been the frequent cause of collisions with other vehicles. Equipment operators must exercise increased vigilance under such conditions.

12.5.3. Making repairs, adjustments, or oiling equipment while it is in motion is prohibited. Before any adjustment or repair is made, the equipment must be stopped and taken out of gear. Employees are not permitted to jump on or off equipment while it is moving.

12.5.4. When operating on the roadway surface or shoulders, the operation shall be conducted in the same direction as the traffic whenever possible.

12.5.5. Operators must take special precautions against placing their equipment too close to the edges of cuts or fills.

12.5.6. Snowplow.

12.5.6.1. **Note:** Only employees who have successfully completed the Snow Plow training (including pre & post OJT hours) are allowed to operate this equipment without direct supervision in accordance with the memo.

12.5.6.2. Driver's Responsibility. The driver is responsible for the following elements for safe vehicle operation and driving techniques listed above as well as the job specific items listed below.

12.5.6.3. Checking the Vehicle Before Operating.

12.5.6.3.1. Safe Operating for Plow Trucks.

12.5.6.3.1.1. Follow all manufacturer and ITD recommendations concerning safe operation and maintenance of equipment.

12.5.6.3.1.2. Only drivers who are properly and thoroughly trained in the operation of the plow truck should operate the vehicle.

12.5.6.3.1.3. Conduct a CDL Walk Around Inspection of the truck before operating

12.5.6.3.1.4. Note any damage or deficiencies on the truck and report them to your supervisor.

12.5.6.3.1.5. Confirm that the truck is safe for you to operate.

12.5.6.3.1.6. Check the area around the truck before placing it into motion.

12.5.6.3.1.7. Always face the truck and maintain 3 points of contact when getting in and out of the truck.

12.5.6.3.1.8. Check safety supplies before taking the vehicle out; verify that you have:

12.5.6.3.1.8.1. Flashlight in good operating condition (extra batteries).

12.5.6.3.1.8.2. Spare plow shear bolts, cotter pins & harness pins.

12.5.6.3.1.8.3. Flares.

12.5.6.3.1.8.4. Tow cable.

12.5.6.3.1.8.5. Shovel.

12.5.6.3.1.8.6. Tire chains (if needed).

12.5.6.3.1.8.7. A duffel bag (or back pack) with your extra warm clothes, food, water, etc.

12.5.6.3.1.8.8 Extra wiper blades and windshield wiper fluid.

12.5.6.3.1.9. Any shortages of or defective safety supplies should be reported to your supervisor as soon as possible.

12.5.6.4. Signing for Winter Maintenance.

12.5.6.4.1. It is impractical to place warning signs for all snowplowing and sanding operations so warning lights such as the flashing amber lights are used on these vehicles. On some sections of highways where snow removal is frequently performed in the opposing traffic lanes should have permanent signs relative to these operations installed and/or traffic control devices utilized according to the MUTCD.

12.5.6.4.2. Every effort shall be made to warn the public of isolated slippery spots or unusual hazardous conditions. During extreme blizzard conditions or other times of low visibility, roads may have to be barricaded. Refer to the District road closure policy and procedures.

12.5.6.4.3. The placing of warning signs is sometimes impractical on patrol maintenance operations, such as removing isolated boulders, straightening signs, etc. However, vehicles used in these operations shall be parked clear of the traveled roadway.

12.5.6.4.4. For more information on Very Short Duration Operations (VSDO) and Short Duration Traffic Control; see Chapter 2 of the Operations Manual.

12.5.6.4.4.1. Warning Flags and Equipment.

12.5.6.4.4.1.1. All vehicles used in normal maintenance activities should be equipped with retro-reflective flagger paddles for use in emergency roadway or flagging operations.

12.5.6.4.4.2. Lights and Flares.

12.5.6.4.4.2.1. No ITD owned (leased) vehicles shall be operated between sundown and sunrise unless equipped with two headlamps and tail lights. Vehicles that may stop or park in a temporary work zone must have a rotating beacon in working condition.

12.5.6.4.4.2.2. Trailers shall be equipped with taillights and stop lamps in good working condition. ITD-owned vehicles shall not operate on the highways between sundown and sunrise unless so equipped.

12.5.6.4.4.2.3. All snowplow vehicles shall be equipped with warning lights and conspicuity markings as specified in the Chapter 9 in the ITD Operations Manual.

12.5.6.5. Chains for Towing, Safety, and Tires.

12.5.6.5.1. All trucks should be equipped with a towing rope, chain or cable in good condition and of sufficient capacity to pull the vehicle without breaking.

12.5.6.5.2. Any time an employee becomes stuck in an ITD vehicle, they shall notify their supervisor, or, failing that, a coworker, for assistance. If there is a chance of damaging the stuck vehicle in the process of getting it out; the best practice would be to call for a tow truck.

12.5.6.5.3. Chains and/or binders/tie-downs will be used whenever any vehicle or trailer is transported from one location to another by another ITD vehicle. (confirm that the chains being used are rated for load securement and are the proper tensile strength for the load in accordance with the North American Cargo Securement Standard).

12.5.6.5.4. ITD trucks should be equipped with a set of tire chains in or on the vehicle in the winter season as needed. Requests for tire chains on pickups, vans and cars will be made to District Management or HQ Equipment Analyst.

12.5.6.5.5. Private vehicles will only be towed by an ITD vehicle when the private vehicle is in a hazardous location, obstructing traffic, endangering the traveling public, or when directed by law enforcement. Vehicles shall be moved only as far as to be parked in a place that will not obstruct traffic. **Prior to moving any privately owned**

vehicle; have the owner/operator sign an ITD-1993, Emergency Assistance Release.

12.5.6.5.6. If it is absolutely necessary for one ITD vehicle to tow another ITD vehicle, only a solid hitch will be used to prevent damage from the towed vehicle ramming the rear of the towing vehicle.

12.5.6.6. Rotary Snow Plows.

12.5.6.6.1. **Note:** Only employees who have successfully completed the Rotary Snow Plow Skills Exam are allowed to operate this equipment without direct supervision.

Warning

Rotary Snow Plows are extremely dangerous when in operation. Keep all personnel 25-feet away from in front of the air blast nozzle or rotary plow head while in operation.

12.5.6.6.2. Do not, under any circumstance, allow any person near or around the air blast nozzle, or the rotary plow head, without confirming that:

12.5.6.6.2.1. The parking brake is set.

12.5.6.6.2.2. The engine(s) stopped.

12.5.6.6.2.3. The key(s) are removed from the ignition(s).

12.5.6.6.2.4. All moving attachments have come to rest.

Warning

Exercise extreme caution when removing impacted snow from around rotary blades inside the rotary plow head. Once freed of snow, blades can rotate and cause severe injury or death.

12.5.6.6.3 Replacing shear bolts in the field.

12.5.6.6.3.1. Ensure machine is shut down according to the steps above.

12.5.6.6.3.2 Utilize a shovel to remove all snow from around plow blade bail to be worked on, keeping hands, arms and head from being caught between rotary blades and plow shroud.

12.5.6.6.3.3. Carefully rotate the plow blade bail by hand to align holes with drive hub. Replace all shear bolts and tighten to appropriate torque specifications.

12.6. Backhoe/Mini Excavator.

12.6.1. Backhoes/Mini Excavators are used on many construction and maintenance projects at ITD. As with any equipment it is important for everyone on the project to be aware of where backhoes/mini excavators are operating to minimize the potential for injury.

12.6.2. **Note:** Only employees who have successfully completed ITD backhoe/mini excavator training (including pre & post OJT hours) are allowed to operate this equipment without direct supervision in accordance with the most current EOTP memo.

12.6.3. The following recommendations can be used to help to create a safe working environment when working around and operating backhoes and excavation equipment.

12.6.3.1. Be sure to read the operator's manual of your assigned machine before you operate the machine.

12.6.3.1.1. Hard Hats are required when working in areas with overhead hazards and within the moving arc of any Backhoe/Mini Excavator. Hard Hats are not required while in the cab of the equipment.

12.6.3.1.2. Locate overhead and underground utility lines before beginning work, call 811 digline before digging below existing grade. Avoid working near overhead power lines. If you must work near them, develop a plan in accordance with local laws to avoid contact.

12.6.3.1.3. Operate hydraulic excavators or backhoes only on grades specified by the manufacturer.

12.6.3.1.4. Position machinery at a safe distance from excavations and trenches.

12.6.3.1.5. Train equipment operators in the proper use of the equipment they are assigned to operate.

12.6.3.1.6. Identify and label all machine controls and ensure they are working properly.

12.6.3.1.7. Securely latch attachments, such as quick disconnect buckets, before work begins.

12.6.3.1.8. Conduct visual and operational checks on all machine systems and operating controls before use.

12.6.3.1.9. Make frequent visual inspections of quick disconnect systems, especially after changing attachments.

12.6.3.1.10. Use the rollover protection system (ROPS) and seat belts supplied by the manufacturer, inspect and replace as directed by the manufacturer.

12.6.3.1.11. Do not exceed load capacities when lifting materials.

12.6.3.1.12. Lower the boom to a safe position with the bucket on the ground and turn off the machine before exiting the equipment for any reason.

12.6.3.1.13. Make all workers on the site aware of the machines' established swing areas and blind spots before the operator works the machine.

12.6.3.1.14. Before each work shift begins, review and confirm communication signals between machine operators and workers on foot.

12.6.3.1.15. Keep workers outside the hydraulic excavator swing areas and clear of attachments when using the machines for hoisting materials.

12.6.3.1.16. Do not allow workers to stand under suspended loads or suspended machine components such as the boom, arm, or bucket.

12.6.3.1.17. Do not permit workers on foot to approach the hydraulic excavator or backhoe loader until they signal the operator to shut down the machine and receive acknowledgment from the operator.

12.6.3.1.18. Use spotters or signal persons around operating equipment when necessary.

12.6.3.1.19. Never permit workers to ride in or work from excavator or backhoe loader buckets.

12.6.3.1.20. Check out the machine you're going to operate. There are two obvious reasons for doing this: one is so you're familiar with the machine, and the other is to make sure it is suitable for the job.

12.6.3.1.21. Look at the general condition of the machine. Check the tires to make sure they are properly inflated and show no outward signs of damage, look for oil leaks, damaged hydraulic hoses, and other obvious signs of abuse or dangerous conditions.

12.6.3.1.22. Look at other features of the machine you will operate, like air conditioning, four wheel drive, extend-a-hoes, and the various special attachments available on these machines.

12.7. Loader.

12.7.1. Loaders are used on many construction and maintenance projects in ITD. As with any equipment it is important for everyone on the project to be aware of where loaders are operating to minimize the potential for injury.

12.7.2. **Note:** Only employees who have successfully completed ITD loader training (including pre & post OJT hours) are allowed to operate this equipment without direct supervision in accordance with the most current EOTP memo.

12.7.3. The following recommendations can be used to help create a safe working environment when working around and operating loaders and other excavation equipment. Be sure to read the operator's manual of your assigned machine before operating it.

12.7.4. Front-End Loader Safety Tips:

12.7.4.1. Never walk or work under a raised loader.

12.7.4.2. Raise and lower loader arms slowly and steadily.

12.7.4.3. Allow for the extra length of the loader when making turns.

12.7.4.4. Take extra precaution when handling loose loads.

12.7.4.5. Never move or swing a load while people are in the work area.

12.7.4.6. Stay away from the outer edge when working along high banks and slopes.

12.7.4.7. Watch for overhead wires and obstacles when you raise the loader.

12.7.4.8. Travel with the load low to the ground and watch for obstructions on the ground.

12.7.4.9. Operate the loader from the operator's seat only.

12.7.4.10. Do not lift or carry anyone on the loader, bucket or attachments.

12.7.4.11. Lower the loader when parking or servicing.

12.7.4.12. Assure all parked loaders are on a firm, level surface and all safety devices are engaged.

12.7.4.13. Visually check for hydraulic leaks and broken, missing or malfunctioning parts, make necessary repairs prior to operating the equipment.

12.7.4.14. Under pressure, escaping hydraulic oil can have sufficient force to penetrate the skin, causing serious personal injury. Injuries resulting from oil penetrating the skin are very difficult to treat. Use a piece of cardboard or paper to check for pinhole leaks.

12.7.4.15. Before disconnecting hydraulic lines, relieve all hydraulic pressure.

12.7.4.16. Be certain anyone operating (or working around) the loader is aware of safe operating practices and potential hazards.

12.7.4.17. Loader operators should wear the seat belt at all times, regardless of the task that is being done.

12.8. Striping Truck.

12.8.1. General.

12.8.1.1. Follow all manufacturer recommendations concerning safe operation and maintenance of chassis, paint dispensing, camera, and communications systems.

12.8.1.2. Most common striping truck accidents happen during loading times, take extra care and be aware of your surroundings during this time.

12.8.1.3. Conduct a group "CDL" Walk-around Inspection of the striping truck before operating. Inspect not only the vehicle chassis, but also the paint dispensing system, cameras and communication systems.

12.8.1.4. Confirm the striping truck is safe for operation, including strobes, signal lights and message boards displaying proper messages. Verify lights and message boards for shadow and pilot vehicle are working properly.

12.8.1.4.1. Note any damage or deficiencies on the truck and report them to your supervisor. Do not operate the vehicle if any system is non-operational.

12.8.1.5. Always face the truck and maintain 3 points of contact when getting in, on, off or out of the truck.

12.8.1.6. Communication among the team is most important – Headsets must be worn by each person while operating the truck. The lead operator of the striping truck must keep in constant contact with other operators on the striping truck, the shadow truck and pilot vehicles. Perform a radio check with all crew members before leaving the parking/loading spot.

12.8.1.7. Check the area around the truck before placing it into motion. Make sure the paint carts are locked and in the stowed positions before traveling.

12.8.1.8. Only operators who are properly and thoroughly trained, or directly overseen by a properly trained and experienced person, in the operation of the many components of the striping truck should operate the vehicle.

12.8.2. Loading Paint and Beads.

12.8.2.1. Forklift Operation. Follow all safety rules for forklift operation from paragraph 12.13 of this chapter. Always be aware of where the forklift is, its path of travel and any obstructions it may strike when in operation. Keep pedestrians clear of the forklift when in operation.

12.8.2.1.1. Operators shall be certified on the appropriate style of forklift used.

12.8.2.1.2 Caution shall be exercised while loading or unloading self-loading forklifts.

12.8.2.2. Verify paint tote valves are closed before removing the drain cap.

12.8.2.3. Driver and painter should check and verify the paint totes are secured to the truck before operation.

12.8.2.4. Follow proper procedures when loading glass beads –- the person in control of the valves must watch the person at the bead container in case the valves are turned incorrectly and create pressure rather than vacuum.

12.8.3. Glass Bead Safety.

12.8.3.1. Wear safety glasses with side shields and gloves when handling glass beads.

12.8.3.2. Do not use a brush or compressed air for cleaning surfaces or clothing after handling glass beads. Avoid the release and swirling of dust.

12.8.3.3. The vacuum line for transferring glass beads shall be grounded to the truck to prevent static electric charge.

12.8.3.4. Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and PPE before entering eating areas.

12.8.3.5. Regularly clean the work area using a vacuum cleaner fitted with an HEPA filter.

12.8.4. Storage. When not in use, keep glass bead containers tightly closed. Store in a dry place. Remove any dust deposits using a vacuum cleaner fitted with HEPA filter.

12.8.5. Maintenance.

12.8.5.1. Wear safety glasses and impervious rubber gloves when servicing pressurized paint systems. Review paint SDS for additional precautions.

12.8.5.2. Close all paint cart valves before working on it, not just the valve controlling the head to be serviced.

12.8.5.3. Exercise extreme caution when releasing stored pressure in the paint delivery system prior to servicing pumps or removing paint filters for cleaning.

12.8.5.3.1. Keep hands out from under the nozzle when working on nozzle to prevent accidental paint blasts onto the hand.

12.8.5.4. Inspect the truck chassis daily and lubricate as directed in chapter nine of the operations manual “Chassis Lube EA82 (PM Type B)” section.

12.8.5.5. Inspect hydraulic, air and paint delivery systems regularly including cylinders, hoses, valve bodies & pumps. Worn or damaged components should be reported to the supervisor or shop superintendent.

12.8.6. Paint/Bead Tote Transport.

12.8.6.1. The transport driver is responsible for safe vehicle loading, load securement and operation of the transport truck including:

12.8.6.1.1. Proper trailer operation (loading/unloading, tracking etc.).

12.8.6.1.2. Proper load placement to meet axel weights & height limitations.

12.8.6.1.3. Proper tie down procedure and devices (chains, binders etc.).

12.8.7. Shadow and Pilot Vehicles.

12.8.7.1. Use appropriate lights and signals as designated by the MUTCD Typical Application based on the road configuration to be painted.

12.8.7.2. Stay in constant communication with all team members.

12.9. Grader.

12.9.1. Graders are used on many construction and maintenance projects in ITD. As with any equipment it is important for everyone on the project to be aware of where graders are operating to minimize the potential for injury.

12.9.2. **Note:** Only employees who have successfully completed ITD Grader training (including pre & post OJT hours) are allowed to operate this equipment without direct supervision.

12.9.3. Standard safe operating practices for grader operators:

12.9.3.1. Danger zone – danger zone is defined as the area around operating machines or working personnel, in which there is potential for being struck by moving equipment or objects. The danger zone may vary according to the machine or work being performed. Operators must make sure that all persons, vehicles and equipment are clear of the danger zone before the vehicle or its components are moved.

12.9.3.2. Mounting and dismounting – three-point contact will be used to mount and dismount equipment.

12.9.3.3. Inspection and repairs – graders will be inspected prior to use to ensure good mechanical condition.

12.9.3.4. When working under or around graders, for inspections or repairs, the grader must be locked and tagged out, and immobilized and secured against inadvertent movement.

12.9.3.5. Housekeeping – cabs, steps, windows, windshields, and mirrors must be kept clean at all times. All debris should be removed.

12.9.3.6. Parking – the grader must be parked on level ground, clear of hazards, with hydraulics grounded to allow ease of access.

12.9.3.7. Travelling – proper gear selection must be used to maintain control. Drive according to road or terrain conditions.

12.9.3.8. Be aware of objects protruding into the work area.

12.9.3.9. Make sure blade is properly positioned when roading or working the grader.

12.9.3.10. Plan ahead to minimize the need for backing.

12.9.3.11. When working on a roadway, always communicate your location to your fellow workers.

12.10. Mowers and Grounds Care Equipment.

12.10.1. This information is intended to comply with the Occupational Safety and Health Administration (OSHA) Standards contained in 29 CFR 1910.243, 212, 29 CFR 1928.51, 57.

12.10.2. Small tractors.

12.10.2.1. It is the tractor operator's responsibility to safely operate the equipment, and to be aware of operational hazards. Always read and follow the manufacturer provided

operator's manual before using a compact tractor. Although many units have similar features, safety and operation features may be unique to each piece of equipment.

12.10.2.2. A tractor operator should wear close-fitting clothes and slip-resistant footwear. Loose clothing and long hair can get caught easily in rotating parts. When working around tractors and PTOs, always walk around the equipment while it is operating, and never step across a rotating driveline.

12.10.2.3. General safety precautions when operating a compact utility tractor:

12.10.2.3.1. Become familiar with the equipment before operating it.

12.10.2.3.2. Review the owner's manual for specific safety instructions.

12.10.2.3.3. Ensure that operators are familiar with the ground where the tractor will be used. Operators should be aware of ditches, uneven ground, and bystanders in the area.

12.10.2.3.4. Prevent indoor carbon monoxide buildup by ensuring that adequate ventilation is always available when starting or operating a tractor indoors.

12.10.2.3.5. Follow safe work practices and set a good example for others.

12.10.2.3.6. Understand fully all equipment safety features and controls.

12.10.2.3.7. Know the equipment's limitations and capacities, and do not exceed them.

12.10.2.3.8. Follow the recommended maintenance requirements.

12.10.2.3.9. Be physically and mentally capable of operating the equipment. Fatigue, stress, medication, alcohol and drugs can detract from safe tractor operation.

12.10.2.3.10. Inspect the equipment for any hazards and correct the hazards before operation.

12.10.2.3.11. Shut down the tractor, turn off the engine, remove the key and wait for all moving parts to stop before dismount or inspection.

12.10.2.3.12. Keep the operator's platform clear of debris.

12.10.2.3.13. Confirm that the "slow-moving vehicle" emblem is in place & free of defects

12.10.2.3.14. Confirm all lights and flashers are operational.

12.10.2.3.15. Make sure the tires are properly inflated and free from damage.

12.10.2.3.16. Make sure the hydraulic system is free from leaks.

12.10.2.4. Rollovers Protective Systems (ROPS) and Seat Belts.

12.10.2.4.1. Many tractor rollovers are caused by inappropriate speed or use, terrain, inattention, lack of proper ballast, or a combination of these factors. Most modern

compact tractors come equipped with seat belts and rollover protective structures (ROPS) mounted to them.

12.10.2.4.2. ROPS are required on all ITD Mowers, Tractors and riding grounds maintenance equipment.

12.10.2.4.3. Use of seat belts is mandatory whenever equipment is in motion.

12.10.2.5. PTO RPM and Ground Speed.

12.10.2.5.1. Ground speed for mowing will depend upon the height, type, and density of vegetation to be cut. Recommended speed for efficient mower performance is between 2 and 5 mph (3-8 kph). Operate the mower at its full rated PTO speed to maintain blade speed for a clean cut. Refer to the tractor operator's manual or the tractor instrument panel for the engine speed and gear to provide the required PTO and desired ground speed. Make sure that the mower is operating at its full rated speed before entering the vegetation to be cut.

12.10.2.5.2. If it becomes necessary to temporarily regulate engine speed, increase or decrease the throttle gradually.

12.10.2.5.3. Ground speed is achieved by transmission gear selection and not by the engine operating speed. The operator may be required to experiment with several gear range combinations to determine the best gear and range which provides the most ideal performance from the mower and most efficient tractor operation. As the severity of cutting conditions increase, the ground speed should be decreased by selecting a lower gear to maintain the proper operating PTO speed.

12.10.2.6. No Riders Allowed.

12.10.2.6.1. Compact tractors have only one seat and are not designed for safe operation with an onboard passenger or a passenger on any attached implements.

12.10.2.6.2. A compact tractor is not a passenger vehicle, and extra riders are never allowed, regardless of the task or the short duration for which they might be there.

12.10.2.7. PTO Shielding.

12.10.2.7.1. Shielding is an effective safety measure used to protect workers from the rotating PTO shaft.

12.10.2.7.2. Become familiar with the shape and location of each shield on PTO-equipped machinery, and inspect the shields regularly for damage.

12.10.2.7.3. Do not use equipment with damaged or missing shields; rather, replace the damaged shields immediately.

12.10.2.7.4. Look for three types of shields when inspecting PTO-equipped machinery: master shield, driveline shaft shield and implement shield.

12.10.3. Mower Safety.

12.10.3.1. Mowers are the most common type of lawn care equipment. To avoid injury with power mower equipment, you must pay close attention to your surroundings. Whether you use a riding mower or a walk-behind mower, follow these guidelines for lawn mower safety:

12.10.3.2. General safety practices for mowing:

12.10.3.2.1. Conduct a pre-mowing inspection of the lawn: Pick up rocks, wires, and sticks before mowing to prevent them from becoming dangerous projectiles.

12.10.3.2.2. Keep all spectators away from the lawn mower while it is in operation.

12.10.3.2.3. Always consult the owner's manual for precautions and instructions on using lawn mowers safely.

12.10.3.2.4. Use earplugs as necessary when operating lawn mowers.

12.10.3.2.5. Inspect mower to verify all guards and safety devices are in place and operating properly.

12.10.3.2.6. Always push the lawn mower forward. Never pull it backward in a motion where a slip will allow your foot under the mower deck.

12.10.3.2.7. Mow across a slope, not up and down as good footing is important in steep slopes.

12.10.3.2.8. Delay mowing when grass is wet. Dry grass is less apt to plug lawn mowers and footing is better on dry grass.

12.10.3.2.9. Keep all mowers in good condition with regular maintenance.

12.10.3.2.10. Use the proper mowing equipment for the task performed.

12.10.3.2.11. Inspect lawn mowing equipment for defects or hazards prior to use.

12.10.3.2.12. Never use damaged mowers (take damaged mowers out of service immediately).

12.10.3.2.13. Operate mowers according to the manufacturer's instructions.

12.10.3.2.14. Use the proper personal protective equipment (PPE).

12.10.3.2.15. Do not operate powered equipment if you are tired, sick, or taking medication.

12.10.3.2.16. Take special precautions when working with electrical equipment. If you are using an extension cord, take care not to accidentally cut it.

12.10.3.2.17. Do not smoke around gas powered equipment. Allow hot equipment to cool before refueling.

12.10.3.2.18. Make sure that all guards are in place and in good condition.

12.10.3.2.19. Shut off the engine and wait for blades to stop spinning before unclogging, servicing, or adjusting the mower and before removing the grass bag.

12.10.3.3. Guards.

12.10.3.3.1. The exposed moving parts of lawn mowing equipment shall be guarded per: 29 CFR 1910.243, 212, ANSI B71.1-2003

12.10.3.3.2. Safety guards must never be removed when a mower is being used. Belts, gears, shafts, pulleys, sprockets, flywheels, chains, or other reciprocating, rotating, or moving parts of mowing equipment must be guarded. Machine guards must be provided to protect the operator and others from the following:

12.10.3.3.2.1. Point of operation.

12.10.3.3.2.2. Rotating parts.

12.10.3.3.2.3. Flying debris.

12.10.3.4. Riding Lawn Mowers.

12.10.3.4.1. It is the operator's responsibility to safely operate the equipment, and to be aware of operational hazards. Always read and follow the manufacturer provided operator's manual before using Riding Lawn Mowers.

12.10.3.4.2. In addition to the general guidelines for mower safety, follow these guidelines for riding lawn mower safety:

12.10.3.4.2.1. Before starting the engine, make sure the transmission is out of gear and the mower blade clutch is disengaged.

12.10.3.4.2.2. Wear your seatbelt

12.10.3.4.2.3. Never allow extra riders on the lawn mower.

12.10.3.4.2.4. Slow down when turning and when working on slopes. Mow up and down slopes rather than across them.

12.10.3.4.2.5. Always look behind you before backing.

12.10.3.4.2.6. If you hit a large rock or stump, stop the mower and inspect the blades and shaft. Replace damaged blades.

12.10.3.4.2.7. Never leave a running lawn mower unattended. Before leaving the seat, park the mower on a flat area, disengage the mower blades, stop the engine and remove the ignition key.

12.10.3.4.3. Walk-Behind Mowers.

12.10.3.4.3.1. It is the operator's responsibility to safely operate the equipment, and to be aware of operational hazards. Always read and follow the manufacturer provided operator's manual before using Walk-Behind Mowers.

12.10.3.4.3.2. In addition to the general guidelines for mower safety, follow these guidelines for walk-behind mower safety:

12.10.3.4.3.2.1. Wear sturdy shoes with good traction. Never wear open-toed shoes around walk-behind mowers.

12.10.3.4.3.2.2. Do not bypass the safety device that stops the blade when the operator releases his/her grip on the handle.

12.10.3.4.3.2.3. Mow across slopes rather than up and down slopes.

12.10.3.4.3.2.4. Work slowly and patiently when mowing tall grass or tough weeds. Forcing the mower may cause repeated clogs and engine stalls.

12.10.3.4.3.2.5. Never leave a running mower unattended. If you stop momentarily, cut the throttle to idle and make sure the mower will not roll away.

12.10.3.4.3.2.6. Steep slopes are both difficult and dangerous to mow. These slopes are good candidates for alternative groundcovers or a no-mow grassed slope that will stabilize the bank and eliminate the need for routine maintenance such as mowing.

12.10.4. Power Blowers.

12.10.4.1. It is the operator's responsibility to safely operate the equipment, and to be aware of operational hazards. Always read and follow the manufacturer provided operator's manual before using Power Blowers.

12.10.4.2. Because power leaf blowers produce air gusts up to 200 mph, you must follow all manufacturers' safety precautions.

12.10.4.2.1. Always walk towards your work when using a power leaf blower. Do not back away from your work.

12.10.4.2.2. Always wear proper PPE (hearing and eye protection) when operating a blower.

12.10.5. Trimming Equipment.

12.10.5.1. It is the operator's responsibility to safely operate the equipment, and to be aware of operational hazards. Always read and follow the manufacturer provided operator's manual before using Powered Trimming Equipment

12.10.5.2. Follow these safety guidelines for trimming equipment such as hedge trimmers, string trimmers, grass shears, and edgers:

12.10.5.2.1. Avoid touching rocks, debris, and gravel with trimming equipment. These items could cause a serious injury if a kickback occurs.

12.10.5.2.2. Make sure all screws and chains are tight. Vibrating equipment can cause screws to loosen.

12.10.5.2.3. Walk towards your work. Do not back away from your work when using a trimmer.

12.11. ATV/UTV.

12.11.1. ATV and UTV vehicles are powerful vehicles that, while handy for many tasks, are capable of causing injury or death. Employees will read and familiarize themselves with the owner's manual or attend an ATV/UTV training course before operating any ATV/UTV. Operators are reminded to always ride within your limitations.

12.11.2. Safety Gear. All ATV and UTV operators shall wear the following PPE when operating ATV/UTV vehicles:

12.11.2.1. Minimum clothing: gloves, over the ankle sturdy footwear, long sleeve shirt, jersey or jacket, and long pants.

12.11.2.2. Operators must always wear a helmet that meets DOT (Department of Transportation) or Snell Memorial Foundation requirements on the label. Helmets should fit snugly and be fastened securely by the chin strap.

12.11.2.3. Eye Protection. A helmet with full face shield, goggles, or safety glasses must be worn. Eye wear should be clean, free from scratches, and vented to prevent fogging. They shall be made of a hard coated polycarbonate. Standard sunglasses are not acceptable eye protection.

12.11.2.4. ATV/UTV vehicles must have a fire extinguisher and first aid kit with them.

12.11.2.5. Seat belts/shoulder harnesses must be used on UTV vehicles.

12.11.2.6. The UTV roll cage and doors (either webbed or plastic covered frame) shall remain installed on the vehicle. They are intended to keep occupants safe within the vehicle.

12.11.3. Walk Around/Pre Operation.

12.11.3.1. Tires and Wheels. Check wheels for cracks, bends, loose lug nuts, worn bearings, etc. Check tire pressure for proper inflation or excessive wear. Check the owner's manual or sticker for required air pressure. However, some aftermarket tires, built for special conditions, may use different pressure, so check the labeling on the tire.

12.11.3.2. Controls and Cables. Familiarize yourself with the location and operation of controls. Ensure proper operation before riding. Check the cables/switches to make sure they operate freely with no binding, sticking, or hanging up.

12.11.3.3. Check hand, foot, and parking brake operation.

12.11.3.4. Know location and operation of shifter and clutch (if applicable).

12.11.4. Lights and Electronics.

12.11.4.1. Check operation of ignition switch, engine stop switch, and light switch.

12.11.5. Fuel, Oil, and Lubrication.

12.11.5.1. Ensure that the vehicle is full of proper fuel and oil (ATV/UTV engines can be 2 or 4 stroke).

12.11.5.2. If 4 stroke (pertains to most ATV/UTVs), oil is checked by dipstick or possibly a sight glass.

12.11.5.3. If 2 stroke, oil and fuel may need to be premixed, or the oil may have a separate oil tank that injects oil into the fuel within the engine (check owner's manual for proper filling and mixing, if applicable).

12.11.5.4. Make sure chains (if applicable) and other lubrication points (grease zerked fittings) have been properly lubed.

12.11.6. Operation.

12.11.6.1. Know your surroundings; rocks, holes, tree roots, logs, or other debris may be in your route of travel. Understanding the location, as well as your ability and the ability of the ATV/UTV, is key to the safe operation and use of the vehicle. Looking into your turn, leaning, rider position, and posturing are all important. Before riding, read the owner's manual, familiarize yourself with the vehicle in a controlled environment, and attend an ATV/UTV rider's class, if available.

12.12. Digger Derrick.

12.12.1. Authority: OSHA 1926 Subpart CC – Cranes & Derricks in Construction, OSHA 1910.184 – Slings, OSHA 1910.269 – Electric Power Generation, Transmission, and Distribution, OSHA 1926.251 – Rigging Equipment for Material Handling

12.12.2. Operator's Responsibility. The operator is responsible for the following elements for safe vehicle operation and driving techniques listed above as well as the job specific items listed below.

12.12.2.1. Perform a CDL walk around inspection as described in ITD form 1422 and Chapter 2 in the ITD Operations Manual.

12.12.2.2. Check safety equipment before taking the vehicle out. See that you have a first-aid kit, a flashlight in good operating condition, flags, flares, a tow cable, shovel, a fire extinguisher in good operating condition and tire chains (if needed). Any shortages or defective equipment should be reported to your supervisor as soon as possible.

12.12.3. The use of a Digger Derrick is subject to certain potential dangers that cannot be protected against by mechanical means. Only the exercise of intelligence, care, and common sense can eliminate these dangers. It is essential to have competent, careful operators who are physically and mentally fit, and thoroughly trained in the safe operation of this Digger Derrick. Learn, understand and practice safe use of all equipment and controls - before operating a Digger Derrick.

12.12.4. General Safety Requirements for Digger Derrick:

12.12.4.1. Conduct a "CDL Walk Around Inspection of the truck before operating.

12.12.4.2. Note any damage or deficiencies on the Digger Derrick and report them to your supervisor.

12.12.4.3. Confirm that the Digger Derrick is safe for you to operate.

12.12.4.4. Check the area around the truck before placing it into motion.

12.12.4.5. Always face the truck and maintain 3 points of contact when getting in and out of the vehicle.

12.12.4.6. Follow all manufacturer recommendations concerning safe operation and maintenance of equipment.

12.12.4.7. Operator's Manual must be on the vehicle available to the operator.

12.12.4.8. Perform inspections and maintenance as specified in the Maintenance Guidelines.

12.12.4.9. Only operator who are properly and thoroughly trained in the operation of the Digger Derrick should operate this equipment.

12.12.4.10. Inspect the boom, outriggers, control station, wire rope & connectors before operating.

12.12.4.11. Never operate the Digger Derrick unless you know the location, function, and operation of all the controls, including emergency and accessory operation.

12.12.4.12. Never exceed the rated load capacity. Know the total weight of the object(s) to be handled. Stay within the rated capacity shown on the load chart.

12.12.4.13. Survey the conditions of the work area. Identify situations such as; soft ground, ditches, drop-offs, holes, debris, overhead obstructions, electrical conductors, underground utilities, stored fuels, toxic dust and gases.

12.12.4.14. Plan the job (tailgate session) and clear the area of unauthorized personnel.

12.12.4.15. When operating the Digger Derrick, if you become aware of any dangerous condition or hear any unusual noises such as grinding, cracking or grating sounds, STOP

in position. DO NOT move or operate the Digger Derrick until the problem has been diagnosed and resolved.

12.12.4.16. Do not place the boom in/over open traffic lanes. Stop traffic or barricade lanes to divert traffic from area.

12.12.4.17. Never dig until all the underground utilities (such as, electrical lines, gas lines and other lines) have been identified and marked.

12.12.4.18. Call Dig Line-811 before you dig.

12.12.4.19. Always maintain proper clearance from energized power lines.

12.12.5. Training Requirements. Operator training & skills testing will be provided as needed by a third party in coordination with ITD training & development.

12.12.5.1. Training and testing will be conducted on equipment provided by the department (each district will be expected to bring their Digger Derrick (in condition to operate) along with their trainees to any required training.

12.12.6. Operators will be trained & tested on:

12.12.6.1. Equipment inspection.

12.12.6.2. Operation of the auger.

12.12.6.3. Operation of the hoist line.

12.12.6.4. Man bucket operation.

12.12.6.5. Bucket lift platform (also known as a mobile elevated work platform).

12.12.6.6. Operation of the lower & upper controls.

12.12.6.7. Standard hand signals.

12.12.6.8. Rigging procedures.

12.12.6.9. Power line safety.

12.12.6.10. Proper load lifting techniques.

12.13. Forklift

12.13.1. **Authorization**

OSHA Proper Forklift Operation [29 CFR 1910.178], [29 CFR 1910.147]

12.13.2. **Forklift Operations**

12.13.2.1 Pre-operations checks

The forklift must be checked for defects daily — usually by the operator before beginning a shift. Even if you operate a forklift safely, a defect can cause or contribute to a serious accident. Some things to look for are:

- Is the horn working?
- Look for hydraulic leaks in the mast and elsewhere
- Check fuel connections are tight
- Ensure that battery terminals are covered
- Look for grease, oil or other material on the forklift that could catch fire
- Does the engine show signs of overheating?
- Check tires for proper pressure and damage
- Check all controls such as lift, lower, and tilt for smooth operation? Are they labeled
- Look for deformation or cracks in the forks, mast, overhead guard & backrest
- Check lights for proper operation
- Check steering for proper operation
- Check service brakes for proper operation
- Check parking brake for proper operation
- Are seat belts working and accessible?
- Is the load capacity plate readable?

Any defects that would affect safety must be corrected before the forklift is placed in service.

12.13.2.2 Safe operation

Always operate the vehicle according to the manufacturer's instructions. Always wear a seatbelt. Never exceed the rated load and ensure it is stable and balanced. Do not raise or lower the load while traveling. Keep a safe distance from platform and ramp edges. Be aware of other vehicles in the work area. Have clear visibility of the work area and ensure you have enough clearance when raising, loading, and operating a forklift. Use proper footing and the handhold, if available, when entering the lift.

12.13.2.2.1. Check list

- Conduct an operational check after starting the engine.
- Ensure that your way is clear.
- Sound your horn in warning or use a spotter if your view is obstructed.
- Under all travel conditions the forklift must operate at a speed that will permit it to be brought to a stop in a safe manner
- Do not give rides or use the forks to lift people.
- Watch for pedestrians
- Never drive up to anyone who is in front of a bench or any other fixed object.
- Do not travel into a position that, if the forklift jumped forward, the brakes failed, or the wrong lever was pushed, a coworker could be pinned between the forklift and another object.

- If the load being carried obstructs forward view, the driver should travel with the load trailing.
- Consider the use of ground guides, rear-view mirrors, spotters, or other aids to increase visibility.
- Watch for surface obstructions; even a small bump can cause a load to fall off elevated forks
- Drive slowly into and out of warehouses or other buildings. Going from bright daylight into a darkened warehouse may blind drivers just long enough to hit another worker, vehicle or object.
- Consider the noise level in your workplace. Do not assume pedestrians or bystanders are able to hear a back-up alarm.
- When changing directions be aware of the potential of tip overs, collisions with pedestrians, vehicles & objects.
- Cross railroad tracks diagonally wherever possible. Do not park closer than 8 feet from the center of railroad tracks
- Never assume pedestrians or bystanders are aware of the presence of heavy equipment and the intended direction of travel.
- Select a safe area to park. Do not block aisles or exits. If parked on an incline, block the wheels
- Do not engage in stunt driving and horseplay

12.13.2.2.2. Loading and unloading the forklift

- Check the load before you pick it up: Is it stable or will parts slide or fall during transit? Secure it as necessary.
- Do the dimensions and weight of the load fall within the capacity rating of the forklift at the highest elevation and extension you will handle the load? If not, can you break the load into smaller parts?

12.13.2.2.2.1.When you pick up the load:

- Move squarely into position in front of the load.
- Position the forks wide apart to keep the load balanced.
- Drive the forks fully under the load.
- Tilt the mast backward slightly to stabilize the load and lift

12.13.2.2.2.2 Check the destination

- Is the destination flat and stable — or, will the load rock, tilt or lean?
- Never place heavy loads on top of light loads.
- Observe maximum stacking quantities and orientation if printed on cartons.

- Do you know the load bearing capacity of your rack or storage loft destination?
- Are rack legs or support members bent or disconnected? The load bearing capacity of a damaged rack is unknown! Wait until the damaged component has been replaced before loading.
- Are racks arranged back to back with a stock behind where you will place the load? Someone may need to be in the next aisle to control access while you place the load.
- Are wooden stringers or decking laid between front and rear rack beams in good condition?
- If you are stacking, are other pallets in the stack in good condition and capable of supporting the load in addition to what they are already supporting?

12.13.2.2.2.3. When you place the load at its destination

- Move squarely into position in front of the rack or stack where the load will be placed.
- When ready to place the load, tilt the mast to level. Only tilt forward when the load is over the spot where it will be placed.
- Lower the forks and back away.
- Visually verify that the load is stable.

12.13.2.2.3. Tip over.

IN CASE OF A TIPOVER:

- Don't jump. Stay in the forklift.
- Hold tight to the steering wheel.
- Brace feet.
- Lean AWAY from the impact.
- Lean forward.

12.13.2.2.4. A powered industrial truck is considered "unattended": When the operator is 25 ft. or more away from the vehicle even if it remains in his view, or whenever the operator leaves the vehicle and it is not in his view.

When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set.

NOTE: If the forklift is disabled, and the forks cannot be lowered to the floor, follow proper lockout/tag-out procedures. Refer to **chapter 13**.

12.13.2.3. Lifting and lowering people

Never allow anyone to be lifted while standing on the forks or on a pallet lifted by the forks! If you want to use a forklift to raise an employee to an elevated position, use a cage or platform specifically built for this purpose that meets these conditions:

- The platform must have standard guardrails which include a top rail 36” to 42” above the platform (39” to 45” on a construction site), mid-rail and toe-board. It must also prevent contact with chains and shear points on the mast. See the illustration for an example.
- The platform must be securely attached to the forks such as by a clamp or chain.
- Check with the forklift manufacturer to verify that the hydraulic system will not allow the lift mechanism to drop faster than 135 feet per minute in the event of a system failure. Identify the forklift as approved for use with the platform.
- Lock or secure the tilt control to prevent the boom from tilting.
- A forklift operator must be at the normal operating position when lifting and lowering the platform. The operator must be near the forklift while a worker is elevated.
- Do not allow personnel to grasp or place their arms, head or legs within the forklift boom, fork load backrest.

Except to inch or maneuver at low speeds, do not move the forklift between two points when a worker is on the platform.

12.13.2.4. Training

Only trained and certified workers may operate a forklift.

- Ensure operators are trained on types of trucks in use.

Forklift training will fall into three segments:

- Formal instruction; lecture, discussion, interactive computer learning, videotape and or written material (can be taken anywhere)
- Practical training which includes hands-on demonstrations by the trainer and exercises by the trainee (on the model of forklift the worker will use)
- An evaluation of the effectiveness of the training by observing the operator’s performance while doing actual work using the forklift. This evaluation must be repeated at least once every three years.

Refresher training must be given if the operator has been involved in an accident, near miss or unsafe operations. Also, if an operator is assigned to a new type of forklift or if workplace conditions change that could affect safety, then refresher training is required.

12.13.2.5. Maintenance

Remove from service any forklift found to be in unsafe operating condition. Keep forklifts in clean condition; free of excess oil and grease. Repair and maintain according to the manufacturer's recommendations.

12.14. Bucket Trucks & Self-propelled Mobile Work Platforms.

12.14.1 Authority: OSHA Standard 29 CFR 1910.269- Electric Power Generation, Transmission, and Distribution, 1910.67- Vehicle-mounted elevating and rotating work platforms.

12.14.2 The use of Bucket Trucks & SPMWP's (Self-Propelled Mobile Work Platforms) are subject to certain potential dangers that cannot be protected against by mechanical means. Only the exercise of intelligence, care, and common sense can eliminate these dangers. It is essential to have competent, careful operators who are physically and mentally fit, and thoroughly trained in the safe operation of Bucket Trucks & SPMWP's. Learn, understand and practice safe use of all equipment and controls - before operating Bucket Trucks & Self-Propelled Mobile Work Platforms

12.14.3 Operator's Responsibility and General Safety Requirements for Bucket Trucks & SPMWP's:

12.14.4. The operator is responsible for the following elements for safe vehicle operation and the job specific items listed below:

12.14.4.1. Conduct a CDL Walk-around Inspection of the truck before operating in accordance with Chapter 2 in the Operations Manual.

12.14.4.2. Note any damage or deficiencies on the Bucket Truck & SPMWP and report them to your supervisor.

12.14.4.3. Confirm that the Bucket Truck & SPMWP is safe for you to operate.

12.14.4.4. Check the area around the truck before placing it into motion.

12.14.4.5. Always face the truck and maintain 3 points of contact when getting in and out of the vehicle.

12.14.4.6. Follow all manufacturer recommendations concerning safe operation and maintenance of equipment.

12.14.4.7. Operator's Manual must be on the vehicle available to the operator.

12.14.4.8. Perform inspections and maintenance as specified in the Maintenance Guidelines.

12.14.4.9. Only operators who are properly and thoroughly trained in the operation of the Bucket Trucks & SPMWP should operate this equipment.

12.14.4.10. Inspect the boom, outriggers, control station& connectors before operating.

12.14.4.11. Never operate the Bucket Truck & SPMWP unless you know the location, function, and operation of all the controls, including emergency and accessory operation.

12.14.4.12. Never exceed the rated load capacity. Know the total weight of the object(s) to be handled. Stay within the rated capacity shown on the load chart.

12.14.4.13. Survey the conditions of the work area. Identify situations such as; soft ground, ditches, drop-offs, holes, debris, overhead obstructions, electrical conductors, underground utilities, stored fuels, toxic dust and gases.

12.14.4.14. Plan the job (tailgate session) and clear the area of unauthorized personnel.

12.14.4.15. When operating the Bucket Truck & SPMWP, if you become aware of any dangerous condition or hear any unusual noises such as grinding, cracking or grating sounds, STOP in position. DO NOT move or operate the Bucket Truck & SPMWP until the problem has been diagnosed and resolved.

12.14.4.16. Do not place the boom in/over open traffic lanes. Stop traffic or barricade lanes to divert traffic from area.

12.14.4.17. Always maintain proper clearance from energized power lines.

12.14.4.17.1. For lines rated 50 kilovolts (kV) or less, the minimum clearance between lines and any part of the aerial lift shall be at least 10 feet (305 centimeter [cm]).

12.14.4.17.2. For lines rated over 50 kV, the minimum clearance between lines and any part of the aerial lift shall be at least 10 feet (305 cm) plus 4 inches (10 cm) for each kilovolt over 50 kV, or twice the length of the line insulator, but never less than 10 feet (305 cm).

12.14.4.18. The insulated portion of an aerial platform shall not be altered or used in a manner that might reduce its insulating value

12.14.4.19. Aerial work platforms certified for electrical use shall be tested and inspected by an independent agency annually. Buckets must be kept clean and free of dirt, bird droppings or tree sap. Do not clean the fiberglass portion of bucket with solvents that may cause damage.

12.14.5. Vehicle-mounted elevating and rotating platforms:

12.14.5.1. This class of vehicle includes bucket trucks for electrical work and tree/brush cutting. It also includes self-propelled boom lifts such as JLG or Genie.

12.14.5.2. Any modifications to these vehicles shall conform to ANSI A92.2. and 29 CFR 1910.67., Vehicle-Mounted Elevating and Rotating Work Platforms.

12.14.5.3. Inspections and Testing

12.14.5.3.1. Annual Mechanical Inspection: Articulating and extendible boom platforms shall be inspected and tested annually. Special inspections and tests shall be conducted immediately following any use where the work platform may have been loaded beyond the manufacturer‘s rated capacity, or immediately following any repair of a boom or work platform assembly structural or mechanical component. Refer to the ITD 2755 Inspection Report, Operator’s Manual and ANSI A92.2. for inspection requirements

12.14.5.3.2. Annual Electrical Tests: Articulating and extendible boom platforms with integral insulating material of high dielectric properties shall be inspected and tested annually by a certified outside agency.

12.14.5.3.3. Daily Inspections: Visual inspections and operating tests shall be made by the operator in accordance with the manufacturer's recommendation, to include, but not be limited to, the following:

- Verify the dielectric inspection has not lapsed prior to using bucket truck for electrical operations.
- Visual inspections of all attachment welds between actuating cylinders and booms or pedestals.
- Visual inspection of all pivot pins for security of their locking devices.
- Visual inspection of all exposed cables, sheaves, and leveling devices both for wear and security of attachment.
- Visual inspection of hydraulic system for leaks and wear.
- Visual inspection of boom and basket for cracks, abrasions, and cleanliness.
- Check lubrication and fluid levels.
- Check operation of boom from ground controls through one complete cycle. Look for unusual noises and deviations from normal operations.

12.14.6. Operation

12.14.6.1. Workers who use vehicle-mounted elevating and rotating work platforms shall be thoroughly trained in all aspects of the job before using this equipment. This shall include hands-on-training prior to actual on-the-job training tasks.

12.14.6.2. Each district shall have additional employees (other than electricians) trained on the bucket truck operation that can provide assistance to regular operators when needed.

12.14.6.3. A qualified worker shall be present on the ground whenever an aerial device is being used to work on or near electrical systems 600-volts or greater. This is to provide assistance and access emergency assistance if needed. Ground personnel are recommended but not required for all other operations. Ground personnel when used shall

be immediately available in the event of an emergency and shall have lowering means readily accessible from ground level.

12.14.6.4. Vehicle-mounted elevating and rotating work platforms shall be equipped with fall protection connection points. Workers must wear an approved fall protection harness with connection point between the shoulder blades and suitable fall protection lanyard. Lanyard length cannot exceed 4 feet unless a self-retracting lanyard is used. Waist belts are prohibited.

12.14.6.4.1. Workers shall connect their lanyard to the fall protection connection point prior to the equipment being elevated from the cradle. The lanyard will be attached to the connection point on the boom of the aerial lift whenever possible. This may not be possible when the bucket is mounted greater than an arm's length from the boom. In this case attach the lanyard to the connection point on the bucket. It is highly recommended workers utilize a small self-retracting lanyard and attach to the connection point on the boom. (See Chapter 10.5 of this safety manual for further guidance on Fall Protection)

12.14.6.4.2. Flashing warning lights shall be installed on all vehicle-mounted elevating and rotating platforms, including bucket trucks, so they are visible from the front and rear of the unit. Flashing lights shall be mounted in accordance with Chapter 9 of the ITD Operations Manual. Lights shall be in operation anytime the vehicle is parked in the traffic pattern, on the side of the road and/or when the boom is elevated.

12.14.6.4.3. Before a mobile unit is moved for travel, the aerial device shall be secured in the specified lower traveling position (to prevent rotation) by the use of cradles or locking devices IAW manufacturer‘s instructions.

12.14.6.4.4. Articulating and extendible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. In order to prevent inadvertent actuation of the platform boom positioning controls, operation of an unlocking device shall precede use of the control itself and shall be maintained simultaneously during use of the controls. The unlocking device may be incorporated into each control. Lower controls shall override upper controls. Controls shall be plainly marked with their function. The override mode shall prevent boom movement with the lower control station unattended. Lower level controls shall not be operated without permission from the employee in the lift, except in an emergency.

12.14.6.4.5. Boom and basket load limits specified by the manufacturer shall not be exceeded.

12.14.6.4.6. Aerial lift trucks shall not be moved with the boom elevated and personnel in the basket unless the lift truck is specifically designed for such operation. In all cases, the manufacturer‘s operating instructions shall be followed.

12.14.6.4.7. Vehicle-mounted elevating and rotating work platforms shall not be used during high winds, thunderstorms or any other adverse weather conditions which could endanger workers using the platform. Refer to the operator‘s manual.

12.14.6.4.8. Workers shall stand firmly on the basket floor. Do not sit or climb on edge of basket or use planks, boxes, ladders or other devices to elevate the work position within the basket.

12.14.6.4.9. Aerial devices, including insulated aerial devices, shall not be brought into contact with energized or potentially energized conductors. Workers shall not rely on dielectric capabilities of aerial devices.

12.14.6.4.10. Before using an aerial device, the worksite shall be surveyed for hazards, such as un-tamped earth fills, ditches, drop-offs and floor obstructions, debris, overhead obstructions and electrical conductors, weather conditions and presence of unauthorized persons.

12.14.6.4.11. Before and during each use, the operator shall:

12.14.6.4.1.1. Check for overhead obstructions and electrical conductors.

12.14.6.4.1.2. Ensure load weight does not exceed manufacturer‘s rated capacity.

12.14.6.4.1.3. Ensure outriggers and stabilizers are used if required by manufacturer's instructions.

12.14.6.4.1.4. Ensure guardrails are properly installed, including bolts, pins or other locking devices on removable railings and attachments, and that gates are closed.

12.14.6.4.1.5. Use outrigger pads when necessary to provide firm footing.

12.14.6.4.1.6. Set brakes.

12.14.6.4.1.7. Chock wheels before using the lift on an incline.

12.14.7. **Manually-Propelled and Self-Propelled Mobile Work Platform**

12.14.7.1. This class of equipment includes power operated scissor lifts and manually re-locatable work stands 4-feet or higher, accessed by ladder at an angel of over 60 degrees.

12.14.7.2. Work platforms shall have guardrails, mid-rails and toe-boards to prevent workers from falling out or off of platform. The guardrail shall:

12.14.7.2.1. Include a top rail, 42 inches high, and at least one rail midway between top rail and platform surface around its upper periphery. Both rails shall withstand 300

pounds of force applied in any direction. Refer to applicable ANSI standards for additional information.

12.14.7.2.2. Include toe-boards on all sides of platforms where there is exposure to personnel or electrical wires below the platform. Removable toe-boards or the equivalent can be utilized. The minimum toe-board height shall be four (4) inches.

12.14.7.2.3. Include access for personnel entering the platform in the lowered position. Access steps or rungs shall have a slip-resistant surface.

12.14.7.3. Daily Inspections

12.14.7.3.1. Users shall inspect and maintain aerial platforms to ensure proper operation. The frequency of inspection and maintenance shall be based on the manufacturer‘s recommendations and compatible with operating conditions and severity of the operating environment. Aerial platforms not in safe operating condition shall be immediately removed from service until repaired. A qualified person shall make repairs IAW manufacturer‘s recommendations. This periodic inspection shall be documented.

12.14.7.4. Fall Protection: Full-body harnesses shall be worn with lanyard attached to the structural anchor point when using self-propelled mobile work platforms (if guard rails will be removed) with manufacturer-installed structural anchor points and the platform elevated four (4) feet or more above the surface. Self-propelled work platforms manufactured without an approved structural anchor point shall have protective guardrails, mid-rails (when required) and toe-boards installed on all open sides. When within 14 inches of the work surface, i.e., side of a building, guardrails need not be in place on the side that is within 14 inches of a working surface. Bolts, pins or other locking devices shall be provided and used on all removable railings and attachments. Refer to **chapter 10.5.4.**for further guidance on Fall Protection)

12.14.7.5. Operations

12.14.7.5.1. Workers who use manually-propelled elevating aerial platforms and self-propelled elevating work platforms shall be thoroughly trained in all aspects of the job before using this equipment. This shall include hands-on-training prior to actual on-the-job training tasks.

12.14.7.5.2. Aerial platforms shall be given a visual inspection and functional test before use each day or at the beginning of each shift including, but not limited to, the following:

- Operating and emergency controls.
- Safety devices.
- Personal protective devices, including fall protection.

- Air, hydraulic and fuel system leaks.
- Cables and wiring harness.
- Loose or missing parts.
- Tires and wheels.
- Placards, warnings and control markings.
- Outriggers, stabilizers and other structures.
- Guardrail system, including bolts, pins or other locking devices on all removable railings and attachments.

12.14.7.5.3. The operator shall ensure the following before each elevation of the platform:

12.14.7.5.3.1. The aerial platform is operated on a surface within the manufacturer‘s limits.

12.14.7.5.3.2. Outriggers, stabilizers, extendable axles or other stability enhancing means are used as required by the manufacturer.

12.14.7.5.3.3. Guardrails are installed and access gates or openings are closed per manufacturer‘s instructions, including bolts, pins or other locking devices on all removable railings and attachments.

12.14.7.5.3.4. The load and its distribution on the platform and any platform extensions do not exceed the manufacturer‘s rated capacity for the specific configuration.

12.14.7.5.3.5. There is adequate clearance from overhead obstructions.

12.14.7.5.3.6. Minimum safe approach distances to energized power lines and parts are maintained.

12.14.7.5.3.7. The operator and all personnel on the platform wear fall protection devices and other safety gear, as required, at all times.

12.14.7.5.3.8. Self-propelled elevating work platforms shall be in the lowered position prior to being moved. Manually-propelled mobile work platforms shall not be moved with personnel on the working platform. Tools and equipment left on the work platform while the unit is moved shall rest securely on the floor of the platform and be protected by a rail and toeboard.

12.14.7.5.4. Controls for manually elevated platforms shall be clearly marked for direction and function. Controls for platform elevating and lowering mechanisms shall be self-holding and readily accessible from the ground. Controls at the platform are optional.

12.14.7.5.5. Training Requirements. Operator training & skills testing will be provided as needed by a third party in coordination with ITD training & development.

12.15. Specialized Equipment and Other Equipment.

12.15.1. Because of the nature of our work it would be impossible to list all equipment used by the employees of the Idaho Transportation Department. Below are some general safety rules for **all** equipment you will encounter at ITD.

12.15.1.1. Read the operators manual prior to using the equipment.

12.15.1.2. Become familiar with all controls & gauges prior to operating.

12.15.1.3. Follow all manufacture's recommendations for safety and proper use.

12.15.1.4. Walk around inspection prior to using the equipment.

12.15.1.5. Make sure that all persons, vehicles & equipment are clear prior to operation.

12.15.1.6. Start slow.

12.15.1.7. Ask questions (the only dumb question is the one you didn't ask).

12.15.1.8. Be aware of your surroundings while operating the equipment.

12.15.1.9. Ground all implements prior to shutdown.

12.15.1.10. Follow proper cool down and shut down procedures.

12.15.1.11. Walk around inspection after using the equipment.

12.15.1.12. Learn & understand proper lockout procedures for your equipment prior to performing maintenance or repairs.

12.15.2. ITD owns several pieces of specialized equipment that require extra attention such as:

- The Under Bridge Inspection Truck (UBIT)
- High pressure pipe/culvert flushing equipment (Flusher Trucks & Trailers)
- Shot blast equipment
- Drill rigs
- Crack sealing and oil distributing (tar pot) equipment
- Dura Patch
- Street sweepers
- Snow Cats
- Brush chippers
- Milling machines
- Guardrail installation & removal equipment
- Rotary snow plows

12.15.2.1 Each of these types of equipment have unique operating processes and each has a high potential to cause injury or death if not operated properly.

12.15.2.2. Operators of these types of equipment shall complete a comprehensive OJT (or equivalent) training program and fully understand the equipment, its components and proper operation prior to using the equipment.

12.15.2.3. ***It is the responsibility of the unit supervisor to confirm the operator's competency prior to assigning them to operate any equipment.***

Chapter 13 – Control of Hazardous Energy

13.1. General Information.
Employees can be seriously or fatally injured if machinery they service or maintain unexpectedly energizes, starts up, or releases stored energy. This section spells out the steps ITD supervisors must take to prevent accidents associated with hazardous energy. This section addresses practices and procedures necessary to disable machinery and prevent the release of potentially hazardous energy while maintenance or servicing activities are performed. Ref: 29CFR1910.147

13.2. Energy Types.
This section applies to all sources of energy, including, but not limited to: mechanical, electrical, hydraulic, pneumatic, chemical, and thermal energy. This section does not cover electrical hazards from work on, near, or with conductors or equipment in electric utilization (facility wiring) installations. Specific lockout and tagout provisions for electrical shock and burn hazards can be found in *29 CFR* Part 1910.333 Subpart S.

13.3. Applicability.
This section applies to the control of hazardous energy when employees are involved in service or maintenance activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining or servicing machines or equipment.

13.3.1. These activities include lubricating, cleaning or unjamming machines, and making adjustments or tool changes, where the employees may be exposed to hazardous energy. Workers doing service or maintenance activities during normal operations must follow lockout/tagout procedures if they:

13.3.1.1. Remove or bypass machine guards or other safety devices

13.3.1.2. Place any part of their bodies in or near a machine's point of operation

13.3.1.3. Place any part of their bodies in a danger zone associated with machine operations

13.4. Definitions.

- **Lockout:** 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.
- **Lockout Device:** A device that uses a positive means such as a lock, either key or combination type, to hold an energy-isolating device in the safe position and prevent the energizing of a machine or equipment.
- **Tagout:** The placement of a tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.
- **Tagout Device:** Any prominent warning device, such as a tag and a means of attachment that can be securely fastened to an energy-isolating device to indicate that the machine or equipment to which it is attached may not be operated until the tagout device is removed.
- **Energy Isolating Device:** A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.
- **Authorized Employee:** An employee who locks or tags machines or equipment in order to perform servicing or maintenance.
- **Affected Employee:** An employee who is required to use machines or equipment on which servicing is performed under the Lockout/Tagout standard or who performs other job responsibilities in an area where such servicing is performed.

13.5. Requirements for Lockout/Tagout Devices.

13.5.1. Whether lockout or tagout devices are used, they must be the only devices the employer uses in conjunction with energy-isolating devices to control hazardous energy.

13.5.2. The employer must provide these devices and they must be singularly identified and not used for other purposes. In addition, they must have the following characteristics:

13.5.2.1. Durable enough to withstand workplace conditions. Tagout devices must not deteriorate or become illegible even when used with corrosive components such as acid or alkali chemicals or in wet environments.

13.5.2.2. Standardized according to color, shape, or size. Tagout devices also must be standardized according to print and format. Tags must be legible and understandable by all employees. They must warn employees about the hazards if the machine is energized, and offer employees clear instruction such as: “Do Not Start,” “Do Not Open,” “Do Not Close,” “Do Not Energize,” or “Do Not Operate.”

13.5.2.3. Substantial enough to minimize the likelihood of premature or accidental removal. Employees should be able to remove locks only by using excessive force with special tools such as bolt cutters or other metal-cutting tools. Tag attachments must be non-reusable, self-locking, and non-releasable, with a minimum unlocking strength of 50 pounds. Tags must be attachable by hand, and the device for attaching the tag should be a one-piece nylon cable tie or its equivalent so it can withstand all environments and conditions.

13.5.2.4. Labeled to identify the specific employees authorized to apply and remove them.

13.6. Tagout.

13.6.1. When an energy-isolating device cannot be locked out, the employer must modify or replace the energy-isolating device to make it capable of being locked out or use a tagout system. Whenever employers significantly repair, renovate, or modify machinery or install new or replacement machinery, however, they must ensure that the energy-isolating devices for the machinery are capable of being locked out. Tagout devices may be used on energy-isolating devices that are capable of being locked out if the tagout system provides employees with a level of protection equal to that achieved through a lockout system.

13.7. Other Options.

13.7.1. If it is possible to lock out an energy-isolating device, employers must use lockout devices unless they develop, document, and use a tagout procedure that provides employees with a level of protection equal to that provided by a lockout device. In a tagout program, an employer can attain an equal level of protection by complying with all tagout-related provisions of the standard and using at least one added safety measure that prevents unexpected re-energization. Such measures might include removing an isolating circuit element, blocking a controlling switch, opening an extra disconnecting device, or removing a valve handle to minimize the possibility that machines might inadvertently be reenergized while employees perform service and maintenance activities.

13.8. Employee Training.

13.8.1. “Authorized” employees must be trained to implement the energy-control procedures and/or perform the service or maintenance activities. They need the knowledge and skills necessary for the safe application, use, and removal of energy-isolating devices. They also need training in the following:

13.8.1.1. Hazardous energy source recognition

13.8.1.2. The type and magnitude of the hazardous energy sources in the workplace

13.8.1.3. Energy-control procedures, including the methods and means to isolate and control those energy sources

13.8.2. "Affected" employees (usually machine operators or users) are employees who operate the relevant machinery or whose jobs require them to be in the area where service or maintenance is performed. These employees do not service or maintain machinery or perform lockout/tagout activities. Affected employees must receive training in the purpose and use of energy-control procedures. They also need to be able to do the following:

13.8.2.1. Recognize when the energy-control procedure is being used.

13.8.2.2. Understand the purpose of the procedure.

13.8.2.3. Understand the importance of not tampering with lockout or tagout devices and not starting or using equipment that has been locked or tagged out. All other employees whose work operations are or may be in an area where energy-control procedures are used must receive instruction regarding the energy-control procedure and the prohibition against removing a lockout or tagout device and attempting to restart, reenergize, or operate the machinery. In addition, if tagout devices are used, all employees must receive training regarding the limitations of tags. (See *29 CFR* 1910.147(c)(7)(ii).)

13.9. Developing Procedures.

Before beginning service or maintenance, the following steps must be accomplished in sequence and according to the specific provisions of the employer's energy-control procedure:

13.9.1. **Step 1: Detailed Procedures for Equipment.**

13.9.1.1. Begin by making sure you've identified the equipment correctly and accurately, including its specific location. Next, determine the correct procedure for shutting down and restarting the equipment. Detail that procedure, step by step, in writing. Consider all of the energy sources that may be connected to the equipment. Be very specific, because ambiguous language could lead to an incorrect or even dangerous action.

13.9.2. **Step 2: Notify Affected Employees.**

13.9.2.1. When maintenance is going to be performed, all of the employees that may be affected should be notified. Let them know the timing of the work, and how long the equipment may be unavailable. If the unavailability of the equipment requires a change in work processes, be sure they are familiar with the steps to be taken.

13.9.3. **Step 3: Shut Down Equipment Properly.**

13.9.3.1. Explain the shutdown process in detail. It's not enough to say something like "disconnect the machine." To ensure everyone's safety and reduce the potential for damage, the shutdown instructions should be detailed. Spell out the exact actions to be taken and the correct sequence for performing those actions.

13.9.4. **Step 4: Disconnect All Primary Energy Sources.**

13.9.4.1. Although this may seem fairly self-explanatory, once again, it's important to be very detailed. Whether the primary energy sources include electricity, steam, water, gas, compressed air, or others, don't assume that the person performing maintenance will know the correct procedure to follow. Again, explain exactly what needs to be done.

13.9.5. **Step 5: Address All Secondary Sources.**

13.9.5.1. While disconnecting the primary energy sources may remove much of the potential danger, it's possible that there sources of residual energy, such as trapped heat in a thermal system, fumes that may need to be vented, or even tension in a spring assembly. Identify the process that will relieve any remaining pressure or other energy. Also consider other hazards, such as moving equipment that must be secured before work begins.

13.9.6. **Step 6: Verify the Lockout.**

13.9.6.1. Once you've disconnected all primary and secondary sources of energy, attempt to start the equipment to verify that the lockout has been successful. Before you try to start it, verify that nobody is in a position where they could be hurt. Assuming that the procedures have been successful, return all switches and other equipment back to their "off" positions so the machine won't start unexpectedly when the energy sources are reconnected. Once you've verified the lockout, attach a lockout or tagout device to the equipment to ensure that it cannot be started without removing the device.

13.9.7. **Step 7: Keep It In Force During Shift Changes.**

13.9.7.1. The equipment must remain in lockout/tagout condition across shift changes, so that workers arriving at the site are aware that the equipment is out of service. If individual locks or tags are used, the individual responsible for designating the lockout/tagout and the individual responsible for it during the next shift must both be present as the locks or tags are switched.

13.9.8. **Step 8: Bring the Equipment Back On Line.**

13.9.8.1. When the work is done and all tools and other materials have been removed, the machine can be brought back into operation. Here again, the procedure should spell out the exact steps that are involved, along with the correct sequence. For example, you may need to open a particular machine's discharge valves before you open the inlet, so any unexpected water or steam remaining in the lines has a place to go.

13.9.9. Document the above procedures for each machine that may need to be isolated for repairs or maintenance. The below card may be completed, printed, laminated and attached to each machine to facilitate future LOTO.

13.10. Testing Machines, Equipment, or Components.

13.10.1. It is permitted to temporarily remove lockout or tagout devices and the re-energize the machine in limited situations for particular tasks that require energization. Examples of when this may be necessary include when power is needed to test or position machines, equipment, or components. However, this temporary exception applies only for the limited time required to perform the particular task requiring energization. Supervisors must provide effective protection from hazardous energy when employees perform these operations. The following steps must be performed in sequence before re-energization:

13.10.1.1. Clear tools and materials from machines

13.10.1.2. Clear employees from the area around the machines

13.10.1.3. Remove the lockout or tagout devices as specified in the standard

13.10.1.4. Energize the machine and proceed with testing or positioning

13.10.1.5. De-energize all systems, isolate the machine from the energy source, and reapply energy-control measures if additional service or maintenance is required

13.10.2. The employer must develop, document, and use energy-control procedures that establish a sequence of actions to follow whenever re-energization is required as a part of a service or maintenance activity, since employees may be exposed to significant risks during these transition periods.

13.11. Removal and Reenergizing Machines.

13.11.1. Employees who work on de-energized machinery may be seriously injured or killed if someone removes lockout/tagout devices and reenergizes machinery without their knowledge. Thus, it is extremely important that all employees respect lockout and tagout devices and that only the person(s) who applied these devices remove them.

13.11.1.1. Before removing lockout or tagout devices, the employees must take the following steps in accordance with the specific provisions of the employer's energy-control procedure:

13.11.1.1.1. Inspect machines or their components to assure that they are operationally intact and that nonessential items are removed from the area.

13.11.1.1.2. Check to assure that everyone is positioned safely and away from machines.

13.11.2. After removing the lockout or tagout devices but before reenergizing the machine, the employer must assure that all employees who operate or work with the machine, as well as those in the area where service or maintenance is performed, know that the devices have been removed and that the machine is capable of being reenergized. In the rare situation in which the employee who placed the lockout/tagout device is unable to remove that device, another person may remove it under the direction of the supervisor.

13.12. Group Maintenance or Servicing Activities.

13.12.1. When a crew, department, or other group performs service or maintenance, they must use a procedure that provides all employees a level of protection equal to that provided by a personal lockout or tagout device. Each employee in the group must have control over the sources of hazardous energy while he or she is involved in service and maintenance activities covered by the standard. Personal control is achieved when each authorized employee affixes a personal lockout/tagout device to a group lockout mechanism instead of relying on a supervisor or other person to provide protection against hazardous energy.

13.13. Shift Changes.

13.13.1. Employers must make sure that there is a continuity of lockout or tagout protection. This includes the orderly transfer of lockout or tagout device protection between outgoing and incoming shifts to control hazardous energy. When lockout or tagout devices remain on energy-isolation devices from a previous shift, the incoming shift members must verify for themselves that the machinery is effectively isolated and de-energized.

13.14. Use of Outside Contractors.

13.14.1. If an outside contractor services or maintains machinery, the onsite employer and the contractor must inform each other of their respective lockout or tagout procedures. The onsite employer also must ensure that employees understand and comply with all requirements of the contractor's energy-control program(s).

13.15. Review of Procedures.

13.15.1. Supervisor are required to review their procedures at least once a year to ensure that they provide adequate worker protection. As part of the review, employers must correct any deviations and inadequacies identified in the energy-control procedure or its application. Supervisor will document the annual review by signing and dating the end of this shop specific lesson plan.

13.15.2. **Review Requirements.**

13.15.2.1. The periodic inspection is intended to assure that employees are familiar with their responsibilities under the procedure and continue to implement energy-control procedures properly.

13.15.2.2. The inspector, who must be an authorized person not involved in using the particular control procedure being inspected, must be able to determine the following:

13.15.2.2.1. Employees are following steps in the energy-control procedure.

13.15.2.2.2. Employees involved know their responsibilities under the procedure.

13.15.2.2.3. The procedure is adequate to provide the necessary protection, and what changes, if any, are needed.

13.15.2.3. For a lockout procedure, the periodic inspection must include a review of each authorized employee's responsibilities under the energy-control procedure being inspected. Where tagout is used, the inspector's review also extends to affected employees because of the increased importance of their role in avoiding accidental or inadvertent activation of the machinery.

13.15.2.4. In addition, the employer must certify that the designated inspectors perform periodic inspections. The certification must specify the following:

13.15.2.4.1. Machine or equipment on which the energy-control procedure was used

13.15.2.4.2. Date of the inspection

13.15.2.4.3. Names of employees included in the inspection

13.15.2.4.4. Name of the person who performed the inspection

Chapter 14 – Welding, Cutting, and Brazing Safety

NOTE

Compliance with this safety manual is mandatory for all ITD employees. The practices outlined in this manual are designed to keep ITD employees safe from injury while on the job. This content, procedures and best practices are gleaned from various industry standards. In the interest of keeping this manual short, some guidance and procedures are referenced to other outside sources including OSHA standards. This does not indicate that ITD follows OSHA in all instances, or that OSHA standards apply to the State of Idaho. Rather the references in this manual to some OSHA standards is merely an acknowledgment that in certain specific instances OSHA has identified and articulated the best guidance available as a best practice.

14.1. General Requirements.

Welding, cutting and brazing operations present hazardous situations which, if the proper precautions are not taken, can lead to serious injuries or death. Many workers have been injured because they failed to use proper personal protective equipment (PPE), used faulty equipment or from personnel error. The use of protective equipment is the least preferred method of controlling hazards and should not be relied on alone to provide protection against hazards. Protective equipment should be used in conjunction with guards, engineering controls and sound manufacturing practices. Employees engaged in welding or cutting operations shall be well versed in such operations and shall keep in mind the safety of fellow employees as well as their own safety at all times.

14.1.1 **Note:** SDS sheets for all consumable welding products will be filed in accordance with the current GHS procedures and ITD Policies.

14.1.2. Numerous hazardous chemicals and metals are used in fluxes, paints, coatings and fillers. Toxic fumes or gases are released into the atmosphere during welding, cutting and brazing operations. Safety Data Sheets (SDS) provide information about the hazards associated with these products. All filler metals and fusible granular materials carry the following caution:

CAUTION

WELDING MAY PRODUCE FUMES AND GASES HAZARDOUS TO HEALTH. AVOID BREATHING THESE FUMES AND GASES. USE ADEQUATE VENTILATION

14.1.3. Brazing and welding filler metals containing cadmium carry the following warning:

WARNING

CONTAINS CADMIUM - POISONOUS FUMES MAY BE FORMED ON HEATING

14.1.4. Brazing and gas welding fluxes containing fluorine compounds carry the following precautionary wording on tags, boxes or other containers:

CAUTION

CONTAINS FLUORIDES

14.1.4.1. This flux, when heated, gives off fumes that may irritate eyes, nose and throat.

14.1.5. Fires, explosions and injuries can occur from welding operations that are:

14.1.5.1. In the proximity of combustible solids, liquids or dusts.

14.1.5.2. In the presence of possible explosive mixtures of flammable gases and air.

14.1.5.3. In the presence of an oxygen-enriched atmosphere, where hot work is performed.

14.1.5.4. In close proximity of explosive hydrogen gas, which is formed when sulfuric acid comes in contact with mild steel.

14.1.6. Welders shall use only approved protective clothing and equipment

14.1.7. Contractor activities involving welding, cutting and brazing shall meet requirements of 29 CFR 1910.252, Welding, Cutting, and Brazing.

14.1.8. Oxygen and acetylene cylinders in storage are required to be separated by 20 feet or by a noncombustible barrier at least 5 feet high with a fire rating of at least 1/2 hour (CFR 1910.253). Oxygen and acetylene cylinders shall be transported and stored in an upright position and properly secured. If acetylene cylinders must be transported lying down, the cylinders shall be up-righted and not used for 24 hours. All cylinder(s) caps will be in place during transport.

14.1.9. Never use acetylene at a pressure in excess of 15 pounds per square inch, gauge (psig)

14.1.9.1. Never use Oxygen at a pressure in excess of 30 pounds per square inch (psig)

14.1.10. Oxygen and Acetylene cutting and welding systems must be equipped with backflow systems to prevent oxygen from flowing into the fuel-gas supply system or passage of a flash back into the fuel-gas supply system; and to ensure excessive back pressure of oxygen in the fuel-gas supply system.

14.1.10.1. The three functions of the protective equipment may be combined in one device or may be provided by separate devices. See OSHA 29 CFR 1910.253(e)

14.1.11. Follow manufacturer's instructions with respect to the sequence of operations in lighting, adjusting and extinguishing torch flames. Purge hoses in open spaces and away from ignition sources. Light the torch with a friction lighter or stationary pilot flame, keeping a safe distance between the torch and the welder's hands. Point the torch away from persons or combustible materials when lighting. Do not attempt to light a torch from hot metal.

14.1.12. When not in use for extended periods, i.e., 30 minutes or more, or when unattended (no one in the vicinity for observation), shut off fuel gas and oxygen supply at the tank.

14.1.13. Do not open an acetylene valve more than one and one half turns of the spindle and preferably no more than three-fourths of a turn.

14.1.14. Always open the cylinder valve slowly. Do not remove the wrench or handle used to open the cylinder from the stem of the valve while the cylinder is in use.

14.1.15. Do not place work to be welded or heated on a concrete floor. Concrete, when heated, may spall and produce projectiles, exposing the welder to injury from flying hot particles.

14.1.16. Provide appropriate fall protection for welders and helpers when on elevated surfaces. Keep welding areas neat, clean and free from tripping hazards.

14.2. Welding Equipment Precautions.

14.2.1. Protect welding torch hoses from damage caused by contact with hot metal, open flames, corrosive agents or sharp edges.

14.2.2. Prior to use, repair or replace hoses exhibiting leaks, cuts, burns, worn spots or other evidence of deterioration. When parallel lengths of oxygen and acetylene hoses are taped together for convenience and to prevent tangling, not more than 4 inches in each 13 inches shall be covered by tape. Use a soap and water solution to check all recently repaired or replaced hoses for leaks; do not use an open flame. Make sure hoses and hose connections are in serviceable condition. Hose connections shall be of the ferrule type that shall withstand, without leakage, twice the normal service pressure. Welding hoses are color coded: oxygen hoses are green, fuel gases are red and inert-gases or air are black. Hose connections are usually marked STD-OXY for oxygen and STD-ACET for acetylene. The acetylene union nut has a groove cut around the center to indicate left-hand threads. Make-shift repairs to oxygen/acetylene hoses or connections are not authorized.

14.2.3. Provide shielding to protect personnel from heat, sparks, slag, light and ultraviolet (UV) radiation.

14.2.4. Wear appropriate PPE for the welding operation being performed. Welding in confined spaces, manholes or other restricted areas may require additional or special PPE.

14.2.5. Where possible, welding activities shall be isolated from adjacent activities. Workers and other personnel adjacent to the welding areas shall be protected from the radiant energy or spatter of welding and cutting arcs by the use of noncombustible and/or flameproof screens.

14.2.6. Welding booth walls, screens and non-rigid heat and spark barriers used to isolate the welding activity shall be finished to limit reflectivity. Booths, screens, etc., shall be arranged to ensure adequate ventilation. Asbestos-containing materials shall not be used as barriers.

14.2.7. Where arc-welding is regularly performed adjacent to painted walls, the walls shall be painted with a finish having low reflectivity to UV radiation.

14.2.8. Procedures shall be established to prevent personnel entering a welding area from inadvertently being exposed to welding hazards. These procedures shall include, as a minimum, warning signs posted at all personnel entryways of designated welding areas. These signs shall mandate the use of PPE before entering a welding environment.

14.2.9. A fully charged and operable fire extinguisher, appropriate for the task, shall be kept in the work area at all times while welding operations are in progress.

14.2.10. Fire watcher procedures shall be implemented whenever welding activities are within 35 feet of combustible materials, regardless of protection provided. A qualified individual proficient in the operation of available fire extinguishing equipment and knowledgeable of fire reporting procedures shall observe welding or cutting activities. Their duty is to detect and prevent the spread of fire produced by welding or cutting activities.

14.2.10.1. Provide a fire watch for a minimum of 30 minutes after completion of all welding, cutting and brazing work. Do not leave the work area unattended during breaks in work during a work shift. Walk and scan all areas of application checking for hot spots, fumes or smoldering, especially at wall and curb areas, prior to departure prior to leaving the site.

14.2.11. Outside Areas: When work cannot be moved, the area shall be made fire safe by removing combustibles or protecting combustibles from ignition sources.

14.2.12. Fire extinguishing equipment shall be maintained, ready for use, while welding or cutting operations are being performed. Equipment may consist of pails of water, buckets of sand, a hose or portable extinguisher, depending upon the nature and quantity of the combustible material exposed.

14.2.13. Clothing shall provide sufficient coverage and be made of suitable materials to prevent skin burns caused by sparks, spatter, ultra violet radiation or electrical shock. Front pockets and upturned sleeves or cuffs shall be prohibited. Sleeves and collars shall be kept buttoned to prevent hot metal slag and sparks from contacting the skin.

14.2.14. All welders and cutters shall wear protective flame-resistant gloves. All gloves shall be in good repair, dry and capable of providing protection from electric shock by welding equipment. Insulated linings shall be used to protect areas exposed to high radiant energy.

14.2.15. Durable flame-resistant aprons made of leather or suitable materials shall be used to protect the front of the body when additional protection against sparks and radiant energy is needed.

14.2.16. Properly fitted flame-resistant plugs in the ear canals, or equivalent protection, shall be used where hazardous noise levels exist.

14.2.17. When controls such as mechanical or natural ventilation fail to reduce air contaminants to allowable levels or when the implementation of such controls are not feasible,

respiratory protective equipment shall be used to protect personnel from hazardous concentrations of airborne contaminants.

14.3. Eye Protection Requirements.

14.3.1. All welding helmets must meet OSHA 29 CFR 1910.252 requirements.

14.3.2. Eye and face protective equipment shall be inspected for serviceability prior to each use. For sanitary purposes, eye and face protectors shall not be shared by other employees. Helmets shall be used during all arc-welding or arc-cutting operations. When two or more welders are exposed to the hazards of each other's welding operation, goggles shall be worn under the welder‘s helmets or use of noncombustible or flameproof screens or shields to provide protection from harmful rays and flying debris. Helpers or attendants shall be provided with the proper PPE, to include eye protection.

14.3.3. Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations.

14.3.4. All operators and attendants of resistance welding, resistance brazing equipment or while chipping slag shall use transparent face shields or goggles, depending on the particular job, to protect their faces or eyes as required.

14.3.5. Eye protection in the form of suitable tinted goggles or spectacles shall be provided for torch brazing operations or soldering operations. Spectacles shall be equipped with side shields.

14.3.6. Check gas line connections for tightness after assembly and before lighting the torch. Use soapy water or the equivalent, not a flame.

14.4. Welding Safety.

14.4.1. The welder shall never permit the live metal parts of an electrode holder to touch their bare skin.

14.4.2. Welding gloves shall be dry.

14.4.3. Electrode holders shall not be cooled by immersion in water.

14.4.3.1. Never change electrodes with bare hands or wet gloves or when standing on wet floors or other grounded surfaces.

14.4.4. **Plasma Arc-Cutting:** Plasma arc-cutting operations are hazardous because of the high heat, brilliant light and fumes given off. Molten metal splatter and noise are also potential hazards. Engineering controls to mitigate these hazards should be considered during equipment installation.

14.4.5. **Inspection of Equipment:** The welder shall inspect the cables periodically for looseness at the connections, defects due to wear or other damage. Defective or loose cables

are a shock and fire hazard. Defective electrode holders shall be replaced and connections to the holder tightened prior to use.

14.4.6. **Oxyacetylene Welding:** This is one of the most common and widely used welding processes available. It can be used for fusion welding, brazing, soldering, cutting and hard surfacing. Hazards include burns to the skin and eyes, gas or oxygen leaks, flashbacks, cut hose whipping, improper handling and storage of cylinders and the potential for a cylinder to become a missile if it is punctured or if the valve should break off. Both oxygen and acetylene cylinders must be stored according to instructions

14.4.7. **Tungsten-Inert Gas Welding (TIG):** TIG welding is a type of gas-shielded welding especially adapted for light gage metal because of its good concentration of heat, precise heat control and the ability to weld with or without filler metals. It is generally used with such metals as aluminum, magnesium and titanium. The principle hazards are the same as electric arc-welding (possible shock, ventilation and burns), except TIG welding takes place with little or no spatter, sparking or fumes.

14.4.8. **Metal-Inert Gas Welding (MIG):** MIG welding is a type of gas-shielded welding similar to TIG, except it uses a wire fed electrode and is used for heavier gage metals. MIG welding has the same hazards as TIG welding, except it does create sparks, spattering and can easily cause UV radiation burns to exposed skin.

14.4.9. **Zinc:** Indoor welding or cutting involving zinc-bearing base or filler metals coated with zinc-bearing materials shall require mechanical ventilation to remove the fumes.

14.4.10. **Lead:** In confined spaces or indoors, welding or cutting involving metals containing lead, other than as an impurity, or involving metals coated with lead-bearing materials including paint, shall be performed using local mechanical exhaust ventilation. Workers in the immediate vicinity of the cutting operation shall be protected, as necessary, by ventilation, or respiratory protection.

14.4.11. **Mercury:** Welding or cutting indoors or in a confined space involving metals coated with mercury-bearing materials, including paint, shall be performed using local exhaust ventilation or positive pressure air supplied respirators unless atmospheric tests, under the most adverse conditions, have established that the worker's exposure is within permissible concentrations.

14.4.13. **Hexavalent Chromium:** Welding or cutting on materials containing chromium, such as stainless steel and painted surfaces, to include the use of welding rods, may generate hazardous levels of hexavalent chromium.

Chapter 15 – Confined Space Entry Operations

15.1. General Information.
Personnel entering or working in confined spaces may encounter a number of potentially serious hazards. These may include atmospheric hazards such as insufficient oxygen to support life, excessive oxygen levels that increase the danger of fire or explosion, flammable or explosive atmospheres and materials, or toxic gases or materials. In addition, the confined work space may include electrical or mechanical hazards that must be locked out, or engulfment or entrapment hazards. Many of these hazards are not readily apparent, detectable by odor or visible, which may result in workers entering confined spaces without consideration of potential dangers. They shall not enter or work in these spaces until tests, evaluation and prescribed requirements of this standard are performed to ensure safe conditions exist prior to entry and are maintained during the entire work period.

15.1. Classification of Spaces:
A space must meet all of three of these criteria to be considered a Confined Space

15.1.1. Is large enough and so configured that an employee can bodily enter and perform assigned work; and

15.1.2. Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); anything with a lip that must be stepped over or requires a ladder to make entry, and

15.1.3. Is not designed for continuous employee occupancy.

15.2. Characteristics of Confined Space
If the space is determined to be a Confined Space, it must be evaluated to determine if it has one or more of the following characteristics:

15.2.1. Contains or has a potential to contain a hazardous atmosphere;

15.2.2 Contains a material that has the potential for engulfing an entrant;

15.2.3. 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’

15.2.4. Contains any other recognized serious safety or health hazard.

15.2.5. The presence of any ONE of the above characteristics changes the classification of the confined space to a Permit Required Confined Space.

15.2.5.1. Examples of ITD work locations that must be evaluated as potential Permit Required Confined spaces include, but are not limited to, POE scale pits, bridge

abutments, enclosed bridge deck girders, flusher truck tanks, mag/brine storage tanks, storm drain collection pits (drop pits), salt/sand hoppers, sweeper hoppers, culverts, excavations and trenches.

15.2.5.2. Entrants to non-permit space will not perform or allow others to perform any work that could cause a hazardous atmosphere inside the space such as: painting, use of solvents or adhesives, creation of silica dust, welding or cutting.

15.2.5.3. Entries into non-permit required confined spaces are allowed without attendants and entry permits. Even though the confined space is classified as a non-permit confined space, the space may contain other physical hazards, such as slippery surfaces or deteriorated pipe ladders, which may make self-rescue difficult for the entrant. In such cases, it may be appropriate for entrants to use a body harness to facilitate rescue operations, use a buddy system or use other special procedures developed to protect workers inside the space.

WARNING
ITD PERSONNEL WILL NOT ENTER PERMIT REQUIRD CONFINED SPACES UNTIL HAZARDS ARE ASSED BY A TRAINED INDIVIDUAL.

15.3. Confined Space Awareness:
All ITD maintenance, operations and field personnel will be trained on the above Confined Space Awareness content when assigned and or whenever the requirements change.

15.4. Responsibilities.

15.4.1. The Employee Safety & Risk Manager (ESRM) will:

15.4.2.1. Serve as the focal point for implementation of OSHA standard 29CFR1910.156 and 29CRF1926.1201 within the department.

15.4.2.2. Coordinate the department confined space program.

15.4.2.3. Ensure all District Safety Compliance Officers are trained in confined space program requirements. This training shall include a formal confined space course and a hands-on portion. Formal training may be accomplished via computer-based training (CBT), or the OSHA Course 2264, *Permit-Required Confined Space Entry.* Hands on training will cover the requirements of this guidance and specific local issues and conditions. Training shall be documented in TalentEd.

15.4.2.4. Verify organizational entry supervisors are trained, qualified and experienced to authorize permit-required confined space entries.

15.4.2.5. Verify organizational procedures and confirm appropriate rescue teams and equipment are immediately available prior to planned entry.

15.4.2.6. Evaluate the effectiveness of unit procedures implemented to protect the entrants.

15.4.2.7. Upon request assist entry supervisors in the selection of personal protective equipment (PPE).

15.4.2.8. Upon request assist in training entry supervisors who issue entry permits and authorize entries into permit-required confined spaces.

15.4.2.9. Upon requested assist the Engineer Manager or Operations Manager in obtaining training for confined space entry team members.

15.4.2.10. Upon request train organizational confined space entry team members on the requirements contained in this Safety Manual.

15.4.2.11. Publish guidance on the department Respiratory Protection Program assist in selecting appropriate respiratory equipment and enrolling all personnel who may enter confined spaces into the department respiratory protection program.

15.4.2.12. Upon requested assist the Engineer Manager or Operations Manager in obtaining local training on the use, calibration (user) and care of atmosphere testing and monitoring equipment.

15.4.3. Engineer Manager or Operations Engineer will:

15.4.3.1. Ensure all personnel assigned duties and responsibilities that support permit-required confined space program tasks are properly trained, equipped and qualified. This training may be accomplished through completion of OSHA Course 2264, *Permit-Required Confined Space Entry* course or equivalent.

15.4.3.2. Ensure required equipment is procured to support entry into confined spaces. Equipment shall be available and properly maintained.

15.4.3.3. Designate entry supervisors.

15.4.3.4. Ensure all non-permit required confined spaces under their control are reviewed whenever entry is made to ascertain that no changes occurred which would affect the original classification.

15.4.3.5. Identify, evaluate and classify all the confined spaces within their area of responsibility.

15.4.3.6. Obtain atmospheric testing and monitoring equipment.

15.4.3.7. Ensure all confined space Supervisors, Entrants and Attendants are trained on the operation of atmospheric testing and monitoring equipment.

15.4.4. Confined Space Entry (on-site) Supervisor will:

15.4.4.1. Be responsible for authorizing entry, overseeing entry operations and for terminating entry if a change in conditions warrant.

15.4.4.1.1. Sign and issue entry permits

15.4.4.1.2. Revoke the permit when confronted by any unexpected entry conditions.

15.4.4.1.3. Determine acceptable conditions are present at a permit-required space where entry is planned.

15.4.4.1.4. Ensure a qualified person (trained in the operation of direct-reading oxygen, flammability and toxicity monitoring equipment) evaluates and classifies the confined space atmosphere

15.4.4.1.5. Coordinate assistance from local District or shed as required.

15.4.4.1.6. Ensure workers are properly trained and qualified in safe operating and emergency procedures, use of protective equipment and how to egress. Ensure workers who are ill or are on medication that may affect their ability to safely perform assigned tasks are excused from the operation.

15.4.4.1.7. Brief workers on hazards of entry, e.g., effects of inhalation of vapors, potential safety and health hazards or internal confined space operations, etc.

15.4.4.1.8. Inspect work area, tools and equipment to identify and correct hazards.

15.4.4.1.9. Select appropriate PPE with help from ESRM and/or District SCO. Ensure availability, condition and use of all protective clothing and other PPE necessary for safe entry.

15.4.4.1.10. Ensure respiratory equipment is in safe operating condition and personnel are trained on proper procedures for use.

15.4.4.1.11. Ensure all valves are isolated, locked out and blinded or blanked to prevent anything from being accidentally pumped into the confined space.

15.4.4.1.12. Ensure all electrical power sources and electrical equipment meet safety requirements for the atmosphere in the confined space. Also, ensure all electrical power is de-energized, locked out and made electrically safe in accordance with Chapter 8 of this Employee Safety Manual.

15.4.4.1.13. Establish emergency procedures to rescue persons incapacitated in the confined space. These will include:

15.4.4.1.13.1. Ensuring ready availability of rescue and safety-related equipment, such as lifting or retrieval devices, respiratory equipment and others necessary for the entry, as determined by the permit system.

15.4.4.1.13.2. Ensuring adequate attachment points outside the confined space for tying-off or otherwise securing retrieval lines for all authorized entrants.

15.4.4.1.13.3. Providing an equivalent method for rescue when retrieval lines themselves may constitute an entanglement hazard or otherwise cannot be used.

15.4.4.1.13.4. Determining availability of a rescue team or ensure attendant can perform a non-entry rescue.

15.4.4.1.13.5. Ensuring the means, i.e. telephone, radio, etc., for summoning emergency assistance is operable, on hand or easily accessible.

15.4.4.1.14. Ensure qualified personnel conduct atmospheric monitoring prior to allowing entry. Ensure sample test readings are taken in the top third, middle third and lower third of the confined space. Ensure oxygen, LEL and toxicity are monitored as specified in paragraph **15.5.8.**

15.4.4.1.15. Be the last person to sign the entry permit after all conditions are met. If necessary, perform entrant or attendant duties when properly trained. Be permitted to transfer duties of the entry supervisor to another qualified supervisor during the course of entry operations and ensure the new supervisor signs or initials the entry permit when transfer is complete. If space on the permit is not adequate, maintain a list of workers as a separate document and attach it to the entry permit form. Ensure the entry permit is maintained at the site where the entry is planned. **Note:** The entry permit shall be posted at entry portal of the permit-required confined space.

15.4.4.1.16. Provide an attendant for each permit entry as required by this manual. The entry supervisor can authorize an attendant to cover more than one permit entry, provided the duties described in paragraph **15.4.5.** are effectively performed for each permit space monitored and the attendant is within view of all spaces.

15.4.4.1.17. Ensure appropriate vehicle and pedestrian guards, barriers or other means to protect the entry party and attendants from traffic hazards and to protect non-entering personnel from hazards are provided.

15.4.4.1.18. Determine and evaluate the source (e.g., removal of residue from the space, repair of leaking valve or pipe in the space, etc.) of any suspected atmospheric condition found at the time of entry. Make appropriate provisions in case the severity of this hazard could increase while workers are in the space.

15.4.4.1.19. Revoke the entry permit, terminate the entry and secure the site when becoming aware of a prohibited or unexpected condition.

15.4.4.1.20. Ensure workers entering a permit-required confined space are provided a harness and lifeline that does not hinder extracting the person from the space. They shall also ensure the lifeline is securely attached to the harness and adequate points

outside the confined space are available and used to secure the other end of the lifeline. When use of a lifeline would present additional hazards, it shall not be used.

15.4.5. Confined Space Attendants will:

15.4.5.1. Maintain an accurate accounting of all entrants (name and quantity) in the permit-required space.

15.4.5.2. Remain outside the permit space and not attempt rescue involving entry until the rescue team has been notified and assistance has arrived. Make rescue efforts by means of the lifeline until assistance arrives.

15.4.5.3. Maintain continuous communication with all authorized entrants within the permit-required space by voice, radio, visual observation or other equally effective means.

15.4.5.4. Have authority to order entrants to exit the confined space at the first indication of a non-permitted condition, an unexpected hazard, indication of a toxic reaction (e.g., unusual conduct by the entrants) or if a situation outside the space could pose a hazard to the entrants.

15.4.5.5. Know the procedure and have the means to summon immediate emergency assistance, if required.

15.4.5.6. Remain at the attendant‘s post and not leave for any reason (except self-preservation) unless replaced by an equally qualified individual. Order the entrants to exit the space if the attendant must leave and there is no replacement.

15.4.5.7. Keep unauthorized persons from entering the permit-required space.

15.4.6. Confined Space Entrants will:

15.4.6.1. Understand all procedures, safeguards and emergency egress and/or rescue procedures associated with the entry.

15.4.6.2. Follow all safe work procedures required by the entry supervisor.

15.4.6.3. Notify the entry supervisor when hazards exist that have not been previously identified and eliminated or reduced to an acceptable entry condition.

15.4.6.4. Notify the entry supervisor if they are ill or on medication of any type.

15.5. General Requirements.

15.5.1. Confined Space Program Responsibility. The Employee Safety & Risk Manager office is responsible for coordinating the department confined space program. Each organization that requires entry into confined spaces under their control is primarily responsible for its related portions of the confined space entry program.

15.5.2. Entry into a confined space means the action by which a worker passes through an opening into a confined space. Entry occurs when any part of the entrant‘s body breaks the

plane of an opening in the space. Refer to 29 CFR 1910.156., *Permit Required Confined Spaces,* for additional guidance.

15.5.2.1. Confined space means a space that meets all of the following conditions below:

15.5.2.1.1. Is large enough and so configured that a worker can bodily enter and perform assigned work.

15.5.2.1.2. Has limited or restricted means for entry or exit (for example: tanks, vessels, storage bins, hoppers, aircraft belly/lower lobe, vaults and pits are spaces that may have limited means of entry).

15.5.2.1.3. Is not designed for continuous worker occupancy.

15.5.3. Initial Testing and Evaluation of Confined Space Conditions. Operations Engineers and entry supervisors, in coordination with the SCO, must test and evaluate prior to classifying a confined or enclosed space. **Note:** Obvious hazardous spaces, i.e., sanitary sewer manholes, could automatically be classified as permit required without the need for initial testing. Initial testing for classification of confined spaces shall be accomplished by a technically qualified individual. Such evaluations will include, but not necessarily be limited to, the following considerations:

15.5.3.1. The contents or previous contents of the space that may result in the presence of flammables, toxic materials or oxygen-deficient or oxygen-enriched atmospheres.

15.5.3.2. The location and configuration of the space, including restricted access, obstructions, remoteness, etc., which may inhibit or interfere with movement (ability of entrants to self-rescue), ventilation, rescue efforts or firefighting efforts.

15.5.3.3. Potential hazards from the external environment, such as proximity of petroleum, oil and lubricants storage areas; sewer and waste water treatment processes; and underground disposal sites, which could affect the atmosphere or other conditions within the confined space.

15.5.3.4. The types of operations conducted within the space, particularly those that produce toxic materials, flammables, oxygen depletion or enrichment or ignition sources.

15.5.3.5. Fixtures, devices or equipment within the space that may create or contribute to hazardous conditions including piping systems, conduits, ducts, machinery, pressurized lines, etc.

15.5.3.6. The presence of other hazards such as slippery surfaces, deteriorated or unstable ladders, irritant or caustic materials, etc., that may create a serious safety hazard in a confined space environment. Pay attention to the condition of permanently-installed ladders, such as those with metal rungs embedded into concrete walls of manholes or other structures.

15.5.3.7. Initial testing shall be performed from outside the space. Testing of the space may be performed by drop tests or insertion of sample probes and hoses into the space. Testing shall be performed in the following sequence:

15.5.3.7.1. Oxygen Content. Combustible gases are tested after tests for oxygen content because the threat of fire or explosion is more immediate and more life threatening, in most cases, than exposure to toxic gases or vapors.

15.5.3.7.2. Flammable Hazard. Many combustible gas indicators and/or explosimeters (explosion meters) require oxygen for proper operation (generally 10- to 30-percent oxygen by volume). Corrections for known flammable components, if different from the calibration gas, shall be made IAW the manufacturer‘s instructions.

15.5.3.7.3. Toxic Materials. For the determination of initial confined space classification, chemical substances known or expected to be present shall be measured and evaluated for their potential to produce a hazardous atmosphere

15.5.4. Classification of Confined Spaces.

Confined spaces are classified based on measurements of oxygen content, flammability and toxicity by testing. Confined spaces are also classified relative to material contained in the space that could cause engulfment or are configured in a manner that could result in entrapment and/or asphyxiation. All personnel will assume confined spaces are permit-required until proven otherwise by means of testing, evaluation and/or inspection. A trained and qualified worker will conduct testing prior to any entry into permit-required confined spaces.

15.3.4.1. Permit-required confined spaces may be classified as immediately dangerous to life or health (IDLH). This is any condition that poses an immediate or delayed threat to life, that would cause immediate or delayed adverse health effects or that would interfere with a worker‘s ability to escape unaided from a permit-required space.

ITD PERSONNEL ARE NOT AUTHORIZED TO ENTER IDLH PERMIT REQUIRED CONFINED SPACES

15.5.4.2. A non-permit confined space contains no hazardous atmosphere or potentially serious safety hazard, and entrants will not perform any work that could cause a hazardous atmosphere. The space does not have a potential for engulfment, is not configured in a way that would cause entrapment or asphyxiation, or does not contain any other serious safety hazard. Permits, signs and attendants are not required.

15.5.5. Posting Signs. Where confined spaces are designated as permit-required and workers and other personnel could inadvertently enter, the supervisor will ensure personnel are informed of the existence, location and the danger of the permit space by posting danger

signs. A sign stating, *DANGER — PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER* or a commercial equivalent.

15.5.6. Testing of Confined Spaces. Verification testing shall be accomplished prior to entry into permit-required confined spaces. A trained and qualified individual will conduct testing prior to any entry into permit-required confined spaces. If a hazardous atmosphere is identified during pre-entry testing, use forced ventilation to try to clear the hazard for a period of not less than 15 minutes before testing again. If the hazardous atmosphere remains, repeat the process. If the hazard remains, use engineering controls to eliminate the hazard or make a determination about the need for entry under hazardous conditions. **Note:** Continuous forced ventilation is recommended when practical and when it will not interfere with work practices.

15.5.7. Calibration of Monitoring Equipment. Monitoring equipment used to evaluate confined spaces shall be calibrated as established by manufacturer‘s instructions. The user will field check and bump-gas test equipment according to the manufacturer‘s instructions immediately before testing the confined space. Workers will not use equipment that cannot be calibrated or which fails the field check or bump-gas test, until it is repaired and the calibration and/or field check is successfully accomplished.

15.5.8. Atmospheric Monitoring. Many operations may generate hazardous conditions and may require atmospheric monitoring as the work progresses to ensure safe conditions are maintained. The frequency and types of testing are dependent upon prevailing conditions and the nature of the operations. No single rule can be established for all operations and conditions. The entry supervisor shall establish the frequency and type of tests for atmospheric monitoring. If isolation of a permit space is not possible because the space is large or is part of a continuous system (e.g., a sewer), pre-entry testing must be performed to the extent feasible and entry conditions must be continuously monitored in areas where authorized entrants are working. Additionally, continuous monitoring of oxygen levels, flammable vapor levels and toxicity levels shall be accomplished for all permit-required confined space operations. The entry supervisor, with appropriate assistance as stated above, shall carefully evaluate the following types of operations for continuous atmospheric monitoring:

15.5.8.1. Work that may generate hazardous concentrations of toxic materials. (Examples: welding, cutting, brazing, soldering, etc.)

15.5.8.2. Application of preservatives, paints, epoxies, solvents, etc., which may involve hazardous concentrations of toxic or flammable vapors.

15.5.8.3. Cleaning operations, sludge removal, etc., which may produce or cause release of hazardous concentrations of toxic or flammable vapors.

15.5.8.4. Any other operations that may produce or release toxic, flammable or asphyxiating atmospheres or material into the space.

15.6. Written Permit-Required Space Program.
When employees will perform duties in a standing Permit Required Confined Space team the District Engineer, Division Administrator, Operation Engineer or equivalent will develop a written program. This document will include:

15.6.1. General operating and entry procedures applicable to all confined spaces within the organization, which will include the following elements:

15.6.1.1. Measures in place to prevent unauthorized entry (signs, method of training, etc.).

15.6.1.2. Methods used to identify and evaluate the hazards of permit spaces before personnel enter them (site visits, review of historical data, etc.). The entry permit shall list specific hazards and controls.

15.6.1.3. The requirements and procedures for safe permit space entry operations, including, but not limited to, specifying acceptable entry conditions; isolating the permit space; purging, inerting, flushing or ventilating the permit space as necessary to eliminate or control atmospheric hazards; providing pedestrian, vehicle or other barriers as necessary to protect entrants from external hazards; and verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.

15.6.1.4. Required equipment, to include testing and monitoring, ventilating, communications, PPE, lighting, barriers or shields, egress ladders, rescue and emergency equipment, and any other equipment necessary for safe entry and rescue from permit spaces.

15.6.1.5. Procedures established to evaluate acceptable entry conditions through pre-entry testing.

15.6.1.6. Identify the persons by name and duty section who will have active roles as entrants, attendants, entry supervisors, organizational rescue team members and persons who test or monitor the atmosphere in a permit space.

15.6.1.7. Procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees and for preventing unauthorized personnel from attempting a rescue.

15.6.1.8. Procedures for the preparation, issuance, use and cancellation of entry permits for permit required spaces.

15.6.1.9. Procedures to coordinate entry operations when outside contractor personnel are working simultaneously as authorized entrants in a permit space.

15.6.1.10. Procedures necessary for concluding the entry after entry operations have been completed, such as securing the permit space and canceling the permit.

15.7. Confined Spaces Classification

Atmospheric Conditions (Reference Table 15.1 below). The presence of one or more of the conditions identified under Hazardous Atmosphere (second column below) constitutes a hazardous atmosphere, which, by itself, requires the confined space to be classified as permit-required. When all the conditions under Non-Hazardous Atmosphere (third column below) are met, the confined space does not contain a hazardous atmosphere and may be classified as a non-permit space as long as there is no condition in the space that could cause engulfment, a configuration that could result in entrapment or asphyxiation, or other serious safety hazard Some test equipment, i.e., photo ionization detectors (PIDs), provide readings in parts per million (ppm), not as a percent of LEL. Personnel using such equipment shall be able to convert test data from ppm to percent of its LEL, and back, as required.

Table 15.1. Confined Spaces Classification—Atmospheric Conditions. Confined Spaces Classification—Atmospheric Conditions

CONDITION	HAZARDOUS ATMOSPHERE	NON-HAZARDOUS ATMOSPHERE
Flammability	1. Flammable gas, vapor or mist in excess of 10 percent of its lower explosive limit (LEL), or 2. Airborne combustible dust at a concentration that meets or exceeds its LEL. (See Note 1)	1. Flammable gas, vapor or mist less than or equal to 10 percent of its LEL, or 2. Airborne combustible dust at a concentration less than its LEL.
Oxygen	Atmospheric oxygen concentration less than 19.5 percent (158 mm Hg) or greater than 23.5 percent (greater than 179 mm Hg). (See Note 2)	Atmospheric oxygen concentration range from the minimum of 19.5 percent and the maximum of 23.5 percent (158 –179 mm Hg).
Toxicity	An atmospheric concentration of any chemical substance which is capable of causing death, incapacitation, impairment of ability to self-rescue, injury or acute illness due to its health effects or which could result in an exposure or dose in excess of its occupational and environmental exposure limit (OEEL). (See Note 3)	An atmospheric concentration of any chemical substance which is not capable of causing death, incapacitation, injury, impairment of ability to self rescue or acute illness due to its health effects.
Other Condition	Any atmospheric condition that is immediately dangerous to life or health (IDLH) or local conditions that could be potentially hazardous or life threatening.	No atmospheric IDLH condition present.

Note 1: If a chemical substance does not have an occupational and environmental exposure limit (OEEL), other sources of information, such as SDS, National Institute for Occupational Safety and Health (NIOSH) documents consensus standards, etc, may be used to establish an acceptable atmospheric concentration and any other atmospheric condition that is immediately dangerous.

Note 2: Test results may vary from inside the space to the entry area of the confined space. To effectively determine the overall status/classification of the space, consideration must be given to taking measurements to the fullest extent into the confined space without entering the space.

Note 3: Testing Stratified Atmospheres. When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet (1.22 meters) in the direction of travel and to each side. If a sampling probe is used, the entrant‘s rate of progress should be slowed to accommodate the sampling speed and detector response.

15.8. Specific Requirements.

15.8.1. Entry Into Permit Required Confined Spaces. Entry supervisors will ensure workers enter a permit-required confined space only after the ITD Form 0213 Confined Space Entry Permit is completed and signed. The permit is an authorization and approval in writing that specifies the location and type of work to be accomplished. It certifies an evaluation of all existing hazards and the necessary protective measures have been taken to ensure the safety and health of each worker.

15.8.2. Rescue procedures and equipment are critical. Entrants shall be provided guidance and direction on confined space entry and rescue requirements, and the entry supervisor will sign the entry permit as the person responsible for the entry.

15.8.3. Testing and Classification of Confined Spaces. Testing and classification of confined spaces shall be done by a qualified person trained and certified IAW requirements in paragraphs **15.5.8.** Initial testing shall be performed from outside the space.

15.8.4. An entry permit must be approved by the Confined Space Entry Supervisor prior to entry.

15.8.4.1. Permits, issued by an entry supervisor will permit entry into a specific confined space, for a specific purpose, by a specific work crew, for a period not to exceed a single shift. Rescue team entry is exempt from this requirement.

15.8.5. Where operations conducted within the space introduce, or have the potential to introduce, additional hazards within the space, the entry supervisor will ensure these hazardous conditions and operations are covered by the permit and take action consistent with the nature of the operations to control the hazards and maintain safe conditions within the space.

15.8.5.1. When an airborne exposure may exceed an allowable standard or when toxic materials are present or may be introduced into the space, the entry supervisor will contact ESRM or District SCO to determine necessity for respiratory protection equipment. The SCO will provide assistance in selecting the appropriate NIOSH-approved equipment and any other PPE necessary to protect workers.

Note: While the primary concern is the inhalation hazard, additional PPE may be required to protect against skin contact and absorption.

15.8.6. Entry supervisors will ensure personnel entering a permit-required confined space are suited with a harness and lifeline that will not hinder extraction of the person from the space. They will also ensure the lifeline is securely attached to the harness and adequate attachment points outside the confined space are available and used.

Note: When the space is so configured that use of a lifeline would present additional hazards, they shall not be used. However, continuous communication between the entry supervisor and all entrants within the confined space shall be maintained, i.e., via voice, radio, visual observation or other equally effective means. The entry supervisor is responsible for making the final decision about non-use of the lifeline.

15.8.7. The entry supervisor will identify and notify an emergency rescue team, either organizational or local fire department.

15.8.8. The entry supervisor will ensure an attendant is provided for all permit-required confined space entry operations. The attendant will remain outside the space and will establish and maintain communications with the entrants. The attendant will know the procedures and have the capability and means to contact the rescue team or summon emergency assistance if the rescue team is not stationed immediately outside the confined space.

15.8.9. When initial testing indicates ventilation is required to remove contaminants and/or provide adequate oxygen levels, the entry supervisor will ensure ventilation is provided during entry and occupancy of the space.

15.8.10. When operations conducted inside the confined space could encounter or create cause an IDLH atmosphere without industrial ventilation, the entry supervisor will ensure ventilation (general dilution or local exhaust) is used to maintain the atmosphere within the limits specified on the entry permit.

15.9. Emergency and Rescue Procedures.

15.9.1. Responsibilities. The confined space entry permit will include emergency and rescue procedures consistent with each operation that requires entry into a permit-required confined space. The entry supervisor will identify rescue resources prior to conducting entry. Means of rescue include: self-rescue, non-entry rescue or local fire department rescue teams.

15.9.1.1. Self-Rescue. Employees are trained to exit from the confined space.

15.9.1 1.1 Entrants will: Exit from the confined space as rapidly as they can whenever an order to evacuate is given by the attendant, an automatic evacuation alarm is activated or workers recognize the warning signs of exposure to substances whose presence in the confined space is known or expected. Recognize the toxic effects or symptoms of exposure to anticipated hazardous materials they are using.

15.9.1.1.2. Relay an alarm to their attendant and attempt self-rescue immediately on becoming aware of the effects discussed above. The entrants must communicate with the attendant as necessary to enable the attendant to monitor their exit.

15.9.1.2. Local fire department rescue teams: The confined space entry supervisor will contact the local fire department rescue teams prior to entering a permit-required confined space to coordinate emergency rescue assistance and ensure its availability within a reasonable period of time.

15.9.2. Rescue Training: All personnel with responsibility for rescue from confined spaces shall receive hands-on training initially (prior to assignment to rescue duties) and annually thereafter. This training will include removing simulated victims, such as dummies, mannequins or actual persons, from actual or representative confined space that have openings and portals similar to the types from which a rescue may be performed.

15.9.2.1. Entry supervisors will ensure all rescue team members are trained in all items listed for entrants, rescue duties and responsibilities, use of retrieval and rescue equipment, proper wear and use of PPE, CPR and First.

15.9.2.2. Confined Space Tester and/or Monitor. The person designated to conduct tests of confined space atmospheric conditions must be trained in the operation, calibration and care of the specific testing equipment used. The person conducting the tests must be fully trained and certified as qualified to interpret the results. The tester shall meet the training requirements of an entrant if entry is required to conduct the tests.

15.10. Training

15.10.1. Entry supervisors shall ensure all personnel authorized confined space entry or assigned as attendants or rescue personnel are trained. Entry supervisors shall ensure workers are aware of appropriate procedures and controls for entry and that unauthorized entry into such spaces is forbidden.

Warning:

Entry supervisors shall ensure personnel are aware/warned that unauthorized entry can be fatal. Many confined space hazards are impossible to detect without specially designed equipment.

15.10.1. Each member shall be trained prior to being assigned permit-required confined space duties.

15.10.2. General Confined Space Program Training Requirements.

15.10.2.1. Entrants. Entrants will perform the duties and responsibilities. Entry supervisors will ensure all entrants are trained in the following subjects:

15.10.2.2. Hazard Recognition. Prior to entering a permit-required confined space containing a potentially hazardous environment, entrants shall be provided guidance and direction on the nature of the hazards, to include type, signs or symptoms, effects of exposure and the need to perform appropriate testing to determine if it is safe to enter. Refer to an SDS for potential or anticipated atmospheric hazards of the space.

15.10.2.3. Personal Protective Equipment (PPE). Entrants shall be trained and qualified on the proper use of all PPE.

15.10.2.4. Equipment. Entrants shall be trained in the use and care of other equipment, such as monitoring, ventilating, lighting, communications, rescue and emergency equipment and like equipment used in and around confined spaces work areas.

15.11. Documentation of Training.

All confined space training for entry supervisors, entrants, attendants, testers and/or monitors and rescue team members shall be documented. The documentation shall contain each individual‘s name and dates of training. Training frequency may be prior to an entry for just-in-time entries or annual for standing entry teams. Documentation will indicate the type of training conducted, e.g., awareness, attendant, entrant, entry supervisor or tester/monitor. Training shall be documented in TalentEd or equivalent LMS.

15.12. Contractor Requirements.

15.8.1. General. When a District arranges to have a contractor perform work that involves a permit-required confined space entry, the District shall:

15.8.1.1. Notify the contractor that work will be performed in a permit-required confined space.

15.8.1.2. Brief the contractor on contents of the space and known hazards that make the space permit-required.

Chapter 16 Bridge Inspection and Repair

16.1 General Requirements:

ITD has a statutory responsibility to inspect and maintain bridges in accordance with federal and department standards. Maintenance operations on bridges have their own set of hazards unique to bridge work. Some of these hazards are listed in this chapter. This is not a complete list but it should help in developing a JSA (*Job Safety Analysis)* for your specific situation.

16.1.1 General PPE includes:

- Hard hat for overhead impact or electrical hazards
- Eye protection with side shields
- Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted)
- ANSI-approved safety toe protective footwear
- Respiratory protection as necessary-N, R, or P95, filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors

16.2. Work Zone Safety

Don't short cut your safety by cutting corners on your workplace traffic control. An approved traffic control plan shall be on site during inspection and repair operations. Refer to the MUTCD for proper traffic control operations. Do not work over live traffic.

16.3. General Heavy Equipment Safety

When working in a confined area such as a bridge deck, under or around a bridge; ground worker awareness & safe work practiced become paramount to reduce the risk of heavy equipment-related injury.

- Wear your high-visibility clothing when working around heavy mobile equipment
- Avoid positioning yourself in a blind spot or riding on moving equipment
- If your work area is going to near where heavy equipment is working, communicate and understand the work plan/flow of work.
- Eye contact, alert the operator; don't assume that the operator can see you.
- Avoid walking or working under a suspended load.
- Ride only in approved seats and wear a seat belt.

16.4 Unsecured Hazards in the Work Area

- Remove or secure objects (glass, structural members) that may fall while workers work under them
- Use debris netting, sidewalk sheds, canopies, or catch platforms to reduce hazards from falling objects

16.5 Electrical Equipment & other Utilities

- Prior to beginning work; Contact dig line (811) for locating and marking utility lines . Contact utility companies as needed for assistance in shutting off/purging utility lines that may pose a hazard or may be impacted by bridge work.
- Assume that electrical lines are energized until proven otherwise.
- Downed electrical conductors can energize other objects, including fences, water pipes, bushes, trees, and telephone/CATV/fiber optic cables
- Unless de-energized and visibly grounded, maintain proper distance from overhead electrical power lines (at least 10 feet) and/or provide insulating barriers
- Do not approach any gas leaks; if a gas leak is detected, secure spark-producing devices (e.g., engines, tools, electronic, and communications equipment) and evacuate the area until the leak is secured

16.6. Falls From Heights or Through Openings

- Limit access/set up controlled access zones
- Fall protection systems are required when working from height: guardrails, safety nets, or fall arrest systems
- Cover or guard holes and openings as soon as they are created. Covers must support two times the weight (body, equipment, materials) that may be imposed.
- Personal fall arrest system including harnesses, lanyards, lifelines, connectors, anchorages, and anchor points (as needed) Refer to Section 10.5

16.7. Silica, Nuisance Dust, Dried Mud or Silt

- Stay upwind of or away from dust-generating activities, and in particular those involving crystalline silica-containing materials like concrete, brick, tile, drywall, mortar, sand, or stone.
- When inhaled, the fine crystalline silica particles contained in the dust can become lodged deep in the lung, which can lead to silicosis and other respiratory illnesses
- When possible; use water spray or mist to suppress dust generation, especially during operations that may create a lot of dust, such as cutting or sawing silica-containing materials, jack hammering, impact drilling, using heavy equipment, and demolishing structures
- Avoid using compressed air for cleaning surfaces
- Sample worker exposures to silica during dust-generating activities

16.7.1 Personal Protective Equipment

- At a minimum, use respirators with N, R, or P95 filters for work with crystalline silica-containing materials (e.g., concrete, brick, tile, mortar). The use of N, R, or P100 filters may provide additional protection. Higher levels of respiratory protection may be needed for some operations (e.g., cutting concrete, sandblasting, mixing concrete) Refer to **chapter 6** for details on respirator use.
- N, R, or P95 respirators may also be used for nuisance dusts (e.g., dried mud, dirt, or silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors

16.8. Lead Exposure:

Over the years, lead based paint, (sometimes containing as much as 70% lead) has been used on thousands of bridges and steel structures to protect them from corrosion and the effects of weather.

Sources of Exposure

- Lead fumes released by torch cutting, thermos lancing, and welding. These particles are highly respirable.
- Dust created by rivet busters, grinders, scalers, abrasive blasting, and other tools.
- Settled dust stirred up by vibrations from power tools, discharged air from pneumatic equipment or during cleanup and handling waste

16.8.1. Summary of the Lead Standard

Whenever workers are exposed at or above the permissible exposure limit (50 mcg/m 3), contractors must:

- Develop a written compliance program; implement engineering and work practice controls. Update the program at least every 6 months.
- Implement interim controls for lead disturbing tasks until air levels are determined.
- Perform air monitoring and inform workers of results. Repeat air monitoring every 3 months or sooner if conditions might increase exposure.
- Arrange for initial blood lead testing and repeat at least every two months. Setup a medical monitoring program. **Refer to chapter 17**
- Provide hygiene facilities: change areas, clean eating areas, hand washing stations and showers.
- Use HEPA vacuums or wet methods to clean work areas.
- Establish a respiratory protection program.
- Provide protective clothing and equipment.
- Conduct site-specific training about lead hazards and controls. Post warning signs: no eating or smoking.
- Assign a competent person to inspect site daily and correct hazards.

- Reassign workers or provide medical removal benefits if blood lead levels exceed50 mcg/dl (micrograms of lead per deciliter of blood).

16.8.1.1. When Does the Standard Apply?

There are two key factors that determine if the lead standard applies:

- The presence of lead paint on the structure.
- The scope of work includes paint disturbing activities, such as demolition, rivet busting, torch cutting, grinding, and paint removal.
- When these two conditions are met, there is a potential for worker exposure to lead the Employer Must:

Design and implement engineering and work practice controls for each lead disturbing task before work begins.

Begin exposure monitoring and implement Interim Controls If exposure results are:

- Less than 30 mcg/m 3: provide site health and safety program, wash up station, and respirators if requested.
- 30 - 49 mcg/m 3 : provide blood tests, training, and air monitoring.
- 50 mcg/m 3 or more: implement entire standard.

Interim Controls

As soon as workers are assigned to lead emitting tasks, supervisors must provide protection, even if air monitoring has not yet been completed or the job is only going to last a few days. If workers are disturbing lead paint, OSHA assumes that exposures are greater than the PEL (permissible exposure limit) until air monitoring proves otherwise. • All of the requirements listed in the "Summary of the Standard" must be implemented, including wash-up facilities, decontamination procedures, HEPA vacuuming or wet cleanup, and protective clothing.

- Blood tests must be provided within 2 days of exposure.

Respirators are selected based on the task as follows:

Task Category: scraping, manual demolition, chemical stripping, using shrouded tools with dust collectors.

Presumed exposure mcg/m3: 50-500

Respirator: Half-face APR with P-100 (HEPA) filters

Task Category: Rivet busting, power tool cleaning without shrouds, cleaning up abrasives, moving containment

Presumed exposure mcg/m3: 500-2500

Respirator: (HEPA) filters Full-face APR with P-100 (HEPA) filters, PAPR with HEPA filters

Task Category: torch cutting, burning, welding, abrasive blasting

Presumed exposure mcg/m3: 2500+

Respirator: Pressure demand airline

Definitions:

- APR: air purifying respirator
- HEPA: high efficiency particulate air filter
- PAPR: powered air purifying respirator

16.9 Ladder or Scaffold Use

- Inspect ladders for cracked, broken, or defective parts before use
- Do not exceed the load rating of ladders or scaffolds-remember that load ratings include people, tools, and equipment
- Set up ladders and scaffolds on stable surfaces
- Set extension or straight ladders at a 75 degree angle from the ground (1/4 foot back for every foot of rise) and provide 3 feet above an upper landing surface to ease climbing onto/descending from height
- Use non-conductive ladders (e.g., fiberglass) and exercise extreme caution when working near power lines
- Secure ladders that can be displaced by work activities; consider barricades at the base to keep traffic away
- Have a competent person inspect scaffolds before use
- Ensure that the scaffold is plumb, and braced and guyed to prevent tipping, swaying, and displacement
- Ensure that the scaffold is built on base plates and mud sills, or other firm foundations. Footings should be able to support the scaffold without settling or moving. Do not use unstable objects to support scaffolds
- Fully plank each scaffold on all working levels. For wood planking, use wood graded for the intended load
- Provide guardrails or fall protection systems on platforms 6 feet or higher

16.10. Work On, Over or Near Water

- Use additional protections, such as a lifesaving skiff and a ring buoy as appropriate

Additional Personal Protective Equipment

- All personnel should wear Coast Guard-approved Type I or II personal floatation devices

- Watertight boots as needed
- Diving Operations: At no time will ITD personnel engage in underwater inspection or repair of bridge structures or abutments. These activities will be contracted.

16.11. Vessel Operations:

The U.S. Coast Guard has compiled a list of required boating safety equipment, which they have determined to be the minimum equipment and operating standards as deemed necessary under federal laws:

- Life Jackets and personal floatation devices
- Fire Extinguishers
- Horn or Whistle
- Engine compartment ventilation (for inboard engines)

There are other items which are not REQUIRED by the USCG, but considered smart to have on board:

- First aid kit
- VHF radio
- Extra fuel & water
- Tool kit
- Sun protection
- A bucket to use as a bailer
- Oars or paddles

16.12. Power & Hand Tool Use

- Use ground-fault circuit interrupters (GFCIs) or double insulated power tools, or implement an assured equipment grounding program
- Inspect power tool condition (including any cords) and verify operation of safety features before use
- Do not use equipment that is defective, such as equipment with inoperable safety switches, missing guards, frayed/cut cords etc.
- Ground power tools properly
- Avoid standing in wet areas when using portable power tools

Additional Personal Protective Equipment

- Hearing protection-(see noise hazard below)
- Hand protection for cut- and abrasion-control and vibration dampening
- Eye protection appropriate to the impact hazard

16.13. Welding, Cutting or Burning

- Refer to **chapter 13** for welding and cutting.
- Remove flammable and combustible materials from the area
- Do not perform "hot work" such as welding, cutting, or burning in areas where flammable, combustible, corrosive, or toxic substances are being used, stored, or may otherwise be present
- Maintain a fire watch during all hot work until material has cooled
- Ensure fire extinguishers and extinguishing agents are available in the immediate area
- Provide natural, exhaust, or forced ventilation to control exposure to the metal fumes and other contaminants being generated (e.g., generator exhaust)
- Ensure that pipes and other vessels are purged of hazardous materials
- Identify materials that will be welded, cut, or burned and that may contain lead, such as painted surfaces and pipes. Test materials and provide exposure controls identified in 29 CFR 1926.62 as necessary; see Lead hazard

Additional Personal Protective Equipment Refer to **chapter 6**.

- Gloves and protective clothing for the activity being performed
- At a minimum, filtered lenses and face-protection as appropriate for the activity being performed
- Respiratory protection based on anticipated exposure to metal fumes, including lead

16.14. Trenches and Excavations

See **chapter 10** of the Safety Manual for information on trenches and excavations.

16.15. Generators

- Never attach a generator directly to the electrical system of a structure unless a qualified electrician has installed a transfer switch for the generator. If the structure's electrical system is not isolated, it may energize the utility's wiring system for great distances and create a risk of electrocution for utility workers and others in the area
- Always plug electrical equipment directly into the generator using the manufacturer's supplied cords or grounded (3-pronged) extension cords that are rated for the total anticipated load
- Do not overload a generator; it can overheat and create a fire hazard
- Ground and bond generators according to the manufacturer's recommendations; ensure that any manufacturer-required connections are secure before using the generator
- Keep the generator dry; protect with a canopy if needed; do not use it in wet or rainy conditions
- Carbon monoxide (CO) is a poisonous, colorless, and odorless gas that is produced by the incomplete burning of the generator's fuel. CO is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen

- Never use a generator indoors or in enclosed spaces such as garages and basements; opening windows and doors may not prevent CO from building up in those spaces. Do not use a generator outdoors near doors, windows, and vents that could allow CO to enter
- Ensure that a generator has 3 to 4 feet of clear space on all sides and above it to ensure adequate ventilation and cooling
- Before refueling, shut down the generator and allow it to cool

Additional Personal Protective Equipment

- Hearing protection - (see noise hazard below)

16.16. Noise

- Hearing protection when working around potential noise sources and when noise levels exceed 85 dBA. A useful "rule of thumb"-if you cannot hold a conversation in a normal speaking voice with a person who is standing at arm's length (approximately 3 feet), the noise level may exceed 85 dBA

16.17. Exposure to Contaminated Water and/or Contaminated Material

- Reduce the exposure to splash or aerosolized liquid hazards by limiting the number of people in the area and having those in the area stay upwind of water discharge areas
- Ensure that good hygiene, especially hand washing, is practiced before eating, drinking, and smoking. If clean water is not available, use an alternative such as hand sanitizer or sanitizing wipes
- Ensure that cuts and bruises are protected from contact with contaminated water/material
- Clean areas of the body that come in contact with contaminated water/material with soap and water, hand sanitizer, or sanitizing wipes
- If divers are involved, ensure divers and their equipment are appropriately decontaminated (fresh water shower/rinse at minimum) upon completion of dive operations

Additional Personal Protective Equipment

- Goggles if routinely working near splashing water/material
- N, R, or P95 respirators may be necessary for exposure to contaminated water/material that may become aerosolized
- Watertight boots with steel toe and insoles
- Waterproof gloves for contact with contaminated water/material

16.18. Confined Spaces:

See **chapter 15** of this manual for more information on confined spaces and required procedures

16.19. Other Potential Hazards:

The following potential hazards that can be associated with this activity in order to access relevant recommendations in the general recommendations document:

- Cuts and lacerations

- Slips, trips, and falls on working surfaces
- Environmental hazards
- Heat stress
- Cold stress
- Sunburn
- Poisonous plants
- Animal/insect bites

Chapter 17 – Medical Monitoring Program

17.1. Policy.
In certain classifications, current employees are required to pass specific medical tests periodically to assure there is no contamination from the use of paints, chemicals, or toxic materials.

17.1.1. Classifications to participate in the medical monitoring program include, but are not limited to:

17.1.1.1. Pesticide/Herbicide Applicators

17.1.1.2. Bridge Repair Crews

17.1.1.3. Paint Applicators

17.1.1.4. Lab Technicians

17.1.1.5. Mechanics

17.1.1.6. Welder/Machinist

17.1.1.7. Department Pilots

17.1.1.8. Any employee who is required to work with chemicals or toxic materials

17.1.2. The type and frequency of tests will be determined by the occupational health physician that reviews the employee's personal work history, the Safety Data Sheet (SDS) on the products being used, and job duties. Candidates selected to fill one of these classifications will be required to pass the same test procedures prior to certification. If a classified employee is unable to pass a test procedure, he/she will be removed from the job duties involving chemicals until able to do so as certified by a physician. If a probationary employee fails to pass the necessary tests, ITD shall consider this probable cause to terminate him/her from that position. Temporary employees who fail a given test, shall be terminated or assigned to other duties, if available.

17.1.3. Employees whose job duties bring them into contact with hazardous materials will be subject to the standards and guidelines contained in this manual. Participation in medical surveillance and completion of appropriate training will be required. Any condition or practice not in agreement with this manual will immediately be brought to the attention of the ESRM Manager.

17.1.4. Those employees, both male and female, contemplating having a child should be aware of the potential hazards from exposure to toxic chemicals or radiation. Pregnancy will not constitute grounds for termination due to failure to perform those duties that may endanger the health of the unborn child. When an employee suspects or confirms a pregnancy, the employee's supervisor should be notified immediately and an appointment must be made for consultation with the District Safety Compliance Officer or the ESRM Manager. Modification of the employee's job duties that involve potential exposure to

hazardous materials for the duration of the pregnancy will be determined on a case-by-case basis.

17.2. Testing Procedures.
All supervisors are responsible for reporting to their District Safety Compliance Officer or ESRM Manager when an employee has been hired or utilized in positions that work with paints containing hazardous substances, chemicals, solvents, or toxic materials. Contact the District Safety Compliance Officer or ESRM Manager if a work process requires an assessment to determine the hazards. Contact the Coordinator to assess jobs.

17.2.1. **Initial/Baseline Medical Examination.**

17.2.1.1. New employee testing will follow following section on Periodic Medical Examination Procedures. The initial/baseline tests will be completed before the employee begins work in those duties that will expose him/her to toxic or hazardous substances.

17.2.2. **Periodic Medical Examination.**

17.2.2.1. Each employee eligible for ITD's medical testing program will complete ITD-2762, Profile for Medical Testing (Chapter 17, Forms). This form, including the medical release portion (page 6 of ITD 2762), must be complete in order for an analysis to be performed.

17.2.2.2. District supervisors will submit the profile to their District Safety Compliance Officer. District Safety Compliance Officers and headquarters supervisors will send the following information to the ESRM office:

17.2.2.2.1. The completed Profile for Medical Testing ITD 2762.

17.2.2.2.2. The SDS for the product(s) used.

17.2.2.3. These forms will be used by the occupational health physician at the Occupational Medicine OMAClinic (OMC) to prescribe the appropriate tests and perform evaluations based on the information provided and the results of the tests. It is important that this information arrive at OMC as soon as possible to ensure the correct tests are run.

17.2.2.4. OMC will provide instructions to the appropriate clinic or physician in the area. Test results will be returned directly by the clinic or physician to OMC for analysis and reports.

17.2.2.5. The District Safety Compliance Officer or ESRM will:

17.2.2.5.1. Notify the physician's office that the employee will be coming in for blood work.

17.2.2.5.2. Complete ITD 2779, Appointment Sheet for Biological Monitoring Program.

17.2.2.5.3. Review the instruction sheet with the employee. Explain that the purpose of the medical release section is to allow information to be sent to OMC in Boise for analysis.

17.2.2.6. The employee will take the Appointment Sheet for Biological Monitoring Program (ITD 2779) to the clinic or physician. This page provides instruction to the office regarding procedures and billing.

17.2.2.7. Charges from clinics/physicians will be mailed directly to District Business Managers or the ESRM for review and payment.

17.2.3. **Evaluation of Tests.**

17.2.3.1. OMC will do an evaluation of the clinic sample analysis, and any recommendations will be sent directly to the employee's home address. The ESRM will send a copy of the individual "pass/fail" letters for district employees from OMC to the District Safety Compliance Officer for their file, as well as a Summary Report Memo (Annex 17-1) to the headquarters of the employee's supervisor.

17.2.3.2. In the case of a report showing contamination to the employee above predetermined acceptable levels, the employee's supervisor will be notified with a Second Test Request Memo (Annex 17-2). The employee will not be placed in a job position or the employee will be removed from job duties involving the use of chemicals/solvents until the supervisor receives a medical clearance from the employee's physician.

17.2.3.3. If the physician cannot issue a medical clearance, the supervisor will consult with the District Engineer, Division Administrator or Section Manager and the Human Resource Services Manager to determine the appropriate action to take.

17.2.3.4. Medical tests results will be kept on file at the OMC clinic for a period of 20 years, as mandated by OSHA.

17.2.4. **Frequency of Testing.**

17.2.4.1. New and transferred employees participating in the medical monitoring program will be tested:

17.2.4.1.1. Before beginning duties involving exposure to hazardous or toxic substances or environments.

17.2.4.1.2. Upon a physician's recommendation.

17.2.4.1.3. When there is a change in the hazardous or toxic substances with which they work.

17.2.4.1.4. Upon transfer or termination from the job involving exposure to hazardous or toxic substances.

17.2.4.2. Herbicide/pesticide crew employees will be tested at the end of the spray season (usually in the fall).

Annex 17-1
SUMMARY REPORT MEMO

DATE: (CURRENT DATE)

TO: (SUPERVISOR)

FROM: RANDY DANNER , ESRM MANAGER

SUBJECT: BIOLOGICAL MONITORING

Our occupational medical physician has reported there is no laboratory evidence of work-related illness for the following employee(s):

[list name(s) of employee(s)]

The above employee(s) received an individual biochemical analysis at their home address.

cc: Biological Monitoring File

Annex 17-2
SECOND TEST REQUEST MEMO

DATE: (CURRENT DATE)

TO: (SUPERVISOR)

FROM: RANDY DANNER, ESRM MANAGER

SUBJECT: BIOLOGICAL MONITORING RESULTS

The recent biological monitoring conducted for the (Crew Name) showed some test results indicating (Employee Name) would need to have a second test run to confirm there is no work-related contamination. I have discussed this with (Employee Name) and (he/she) is going to make an appointment with (Physician Name) to conduct further tests. Until I receive notification of the second test results, (Employee Name) is to be counseled to not work with any potentially hazardous materials or chemicals, including cleaning solvents, paints, and all pesticides/herbicide products.

RD:

cc: District Safety Compliance Officer
Section Manager or Foreman [If not the direct supervisor]
Biological Monitoring File

17.2.3. **Declining to Test.**

17.2.3.1. An employee may decline testing by signing a Medical Monitoring Program Waiver (Chapter 17, Forms, reproducible). A copy should be kept on file in the district or section and the original sent to the ESRM.

17.2.4. **Post-Exposure Medical Examinations.**

17.2.4.1. Any employee who is accidentally over-exposed to a hazardous substance via inhalation, ingestion, or skin absorption will notify the District Safety Compliance Officer or ESRM immediately.

17.2.4.2. The District Safety Compliance Officer or ESRM will contact a qualified physician so that an examination of the employee can be performed as soon as possible.

17.2.4.3. The District Safety Compliance Officer or ESRM will notify the District Engineer, Division Administrator, or Section Manager and the employee's immediate supervisor will keep them informed of the situation.

17.2.4.4. When needed, the District Safety Compliance Officer or ESRM will ensure that resources for answering toxicological questions (such as MSDS) are available to the examining physician for the chemical(s) in which the employee was exposed.

17.2.4.5. The supervisor, District Safety Compliance Officer, ESRM, or affected employee will provide the examining physician with the following information:

17.2.4.5.1. Identity of the chemical(s).

17.2.4.5.2. Amount/concentration of the chemical(s) to which the individual was exposed (if that information is available), or the best estimate.

17.2.4.5.3. Length of time of the exposure.

17.2.4.5.4. MSDS, if available, on the chemical(s) of concern.

17.2.4.6. The clinical parameters to be performed will be determined by the examining physician.

17.2.4.7. The examining physician will provide a written statement of the examination results to the District Safety Compliance Officer and/or the ESRM. After receiving a copy of the written statement, the ESRM will notify the District Engineer, Division Administrator (or Section Manager), the immediate supervisor, and the employee of the results.

17.2.4.8. The employee and supervisor will complete an ITD1207, Supervisor's Accident Report and HR must file a First Report of Injury with the State Insurance Fund to ensure doctor’s appointment and tests are paid.

17.3. Respirator Program.

Idaho General Safety and Health Standards mandate all employees who wear an air-filtering or air-supplied respirator to accomplish job duties, no matter how infrequently, must be certified by a physician, verifying that they can wear a respirator. As employees are assigned to job duties that require respirator use, the supervisor will notify the District Safety Compliance Officer or ESRM. The District Safety Compliance Officer or ESRM will schedule employees to see a physician in their area who participates in ITD's medical monitoring program. See Section 17.3.4, Medical Determination of Ability to Wear Respirators (All Types), for requirements.

17.3.1. Following is the ITD respirator program in compliance with Idaho Safety Code.

17.3.2. Types of Respirators. There are two basic classes of respirators used by the industrial worker.

17.3.2.1. The first class of respirator is the air-purifying respirator. This includes full-face, half-face, and quarter-face masks, and a wide variety of particulate filters and chemical cartridges. These masks are specified according to the type of operation and chemical use.

17.3.2.2. The second is the supplied-air or atmosphere-supplying respirator, which includes the self-contained breathing apparatus (SCBA) and the hose-line respirator. The SCBA is similar to the scuba worn by an underwater diver in that it also requires the user to wear a tank to supply air. The hose-line respirator supplies air to the user's mask or hood from a tank of compressed air or directly from a compressor.

17.3.3. Supplied air is used during some painting operations, sand-blasting, and entry of underground tanks. There may also be other work procedures or emergency responses that would require supplied-air respirators.

17.3.4. **Determination of the Need for Respirators.**

17.3.4.1. See Industrial Hygiene Evaluation of Work (Exhibit 113) to determine if a respirator is required. Prior to issuance of a respirator, the employee or supervisor will check with the District Safety Compliance Officer, ESRM, or Supply Section to determine the type of respirator needed.

17.3.4.2. Where a respirator is not required, an employee may elect to use one, but must comply with all requirements of this program.

17.3.4.3. Respirators shall not be used in lieu of feasible engineering or administrative controls.

Annex17-3

INDUSTRIAL HYGIENE EVALUATION OF WORK
(Environments Potentially Requiring Respirator Use)

The following items may be considered in the industrial hygiene evaluation:

1. Information about the industrial process:

    a. Type of equipment used
    b. Operation of the equipment
    c. Physical conditions during the operation of equipment (noise, lighting, etc.)

2. Information about the work area:

    a. Size of the work area
    b. Layout of the equipment used
    c. Type of ventilation and its effectiveness
    d. Temperature and humidity in the work areas

3. Information on employee activity:

    a. Job routines followed
    b. Location of employee work stations
    c. Time employee spends in the area (continuous and intermittent)
    d. Work rates, i.e., heavy exertion, light activity, etc.

4. Information on known and potential inhalation hazards:

    a. Chemical composition of components used
    b. Type of contamination
    c. Acute and chronic toxicity data for contaminants present
    d. Established concentration limits for breathing:

        (1) OSHA permissible exposure
        (2) NIOSH criteria documents
        (3) ACGIH threshold limit values
        (4) Other sources

5. Industrial hygiene data, including measurements of the airborne contaminants (performed by industrial hygienist):

    a. Time weighted averages
    b. Peak exposure levels
    c. Mixtures of chemicals

17.3.5. **Choosing and Issuing Respirators.**

17.3.5.1. Respirators must be selected on the basis of the hazards to which employees are exposed. Considerations include the type and concentration of contaminant.

17.3.5.2. Only the respirator type individually assigned and fitted shall be used.

17.3.5.3. Annex 17-3 above contains an outline to assist with the selection of the appropriate respiratory protective device.

17.3.6. **Medical Determination of Ability to Wear Respirators (All Types).**

17.3.6.1. Prior to respirator certification, the employee must receive a medical evaluation by a consulting physician. The medical evaluation shall include both a medical history and an upper respiratory examination if required by the consulting physician.

17.3.6.2. Examinations shall be made every two years to determine that conditions affecting the safe use of respirators have not deteriorated. These evaluations shall be coordinated through the District Safety Compliance Officer or ESRM and the area supervisor.

17.3.6.3. An employee must be re-certified after any major cardio-respiratory illness before working in any situation requiring the use of a respirator.

17.3.6.4. The following information shall be provided by the supervisor and the employee prior to the employee examinations:

17.3.6.4.1. Type of respirator to be used

17.3.6.4.2. Tasks employee will perform

17.3.6.4.3. Energy requirements of the task

17.3.6.4.4. Visual and hearing requirement related to the task

17.3.6.4.5. Substance(s) to which employee will be exposed

17.3.6.5. The District Safety Compliance Officer or HQ ESRM will issue the appropriate forms to each employee. These forms will be completed and distributed as follows:

17.3.6.5.1. The ITD 2779, Appointment Sheet for Biological Monitoring Program, will be completed by the individual making the appointment and given to the employee with the date, time, and location of the exam. The employee will give this page to the examining physician to provide information used by the physician's billing office. Send copy to ESRM office.

17.3.6.5.2. The ITD 2767, Respiratory Questionnaire or OSHA (Chapter 17, Forms), will be completed by the employee and taken to the examining physician's office at the time of appointment. No copy is to be kept as it is confidential.

17.3.6.6. After completion of the medical evaluation, the consulting physician will issue a medical examination report letter similar to the one shown in Annex 17-4.

Exhibit 17-4
Saint Alphonsus

Medical Group

Occupational Medicine

STATE OF IDAHO
TRANSPORTATION DEPARTMENT

MEDICAL EXAMINATION REPORT

Name: Date of Exam:
District: Physician:

_____ Based on the recommendation of the examining physician, this employee is medically qualified for respirator use and shows no evidence of occupational illness.

_____ Based on the recommendation of the examining physician, this employee is medically qualified for respirator use with the following restrictions:
_____

_____ Based on the recommendations of the examining physician, this employee is not medically qualified for respirator use.

_____ Based on the recommendation of the examining physician, this employee shows the following evidence of occupational illness or exposure:
_____

Special Comments:
_____
_____
_
_____
_

_____

17.3.7. **Employee Training.**

17.3.7.1. The employee and supervisor shall be trained in the proper use and maintenance of the respirator, as well as its limitations. This may be taught by the District Safety Compliance Officer, ESRM, or other knowledgeable person(s). A training protocol for air-purifying and supplied-air respirators can be found in Annex 17-5 and Annex 17-6, respectively.

17.3.7.2. Training shall include a written and/or practical examination as part of the respirator certification process.

Annex 17-5
EMPLOYEE TRAINING
(Air-Purifying Respirators)

1. Training shall be conducted prior to the use of respirators on the job and shall cover, as a minimum, the following items:

    a. The reason for wearing a respirator.

    b. The type of respirator to be worn and how it works.

    c. Components of the respirators to be used.

    d. Inspection requirements of the respirator.

    e. Cleaning and maintenance procedures.

    f. Self-administered fit tests prior to use, stressing the importance of a good seal.

    g. Proper storage procedures.

    h. Replacement of cartridges (frequency procedure).

    i. The employee's responsibilities.

    j. Emergency use (if applicable).

    k. Limitations of respirators.

    l. User certification procedures.

2. A written and/or practical exam shall be passed by all respirator users before certification.

Annex 17-6
EMPLOYEE TRAINING
(Supplied-Air Respirators)

All supplied-air respirator users will be trained and fit tested prior to using such equipment. This includes any individuals who may be required to use such respiratory equipment for maintenance, emergency, or rescue activities.

Training shall be conducted by an individual qualified in the use, care, and maintenance of supplied-air respirators. This individual will be designated by the District Safety Compliance Officer or ESRM.

Training shall minimally consist of the following items.

The function and components of the unit, including theory of operation.

Pre-use inspection:

(1) Check tank for air (if applicable).
(2) Perform stretch test to check mask, head straps, and breathing tube.
(3) Check harness straps.

Demonstration:

(1) How to don the unit (posture and sequence of strap tightening).
(2) Proper adjustment of head straps.
(3) How to operate the unit.

Demonstration of good fit and factors that may affect the facial seal:

Positive and negative pressure tests (see Appendix B).
How facial hair affects fit.
Self-administered fit tests.

Proper removal of a supplied-air respirator.

Care, maintenance, and cleaning of a supplied-air respirator (instruction will vary depending on type used).

Procedures to be followed and factors to be considered when using supplied-air respirators in contaminated environments:

(1) Length of air supply (SCBA).
(2) Air-supply warning bell.
(3) Use of standby personnel in IDLH atmospheres.

Limitations of supplied-air respirators.

A written and a practical exam shall be passed by all supplied-air respirator users before certification.

17.3.8. **Fit Testing of Respirators.**

17.3.8.1. Before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. The section specifies the kinds of fit tests allowed, the procedures for conducting them, and how the results of the fit tests must be used.

17.3.8.2. The supervisor shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT), as stated in this section.

17.3.8.3. The supervisor shall ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model, or make) is used.

17.3.8.4. The supervisor shall ensure a fit testis performed whenever the employee reports, or the supervisor or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

17.3.8.5. If, after passing a QLFT, the employee subsequently notifies the program administrator or supervisor that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator facepiece and to be retested.

17.3.8.6. The fit test shall be administered using an OSHA compliant QLFT protocol.

Annex 17-8

INSPECTION AND MAINTENANCE
(Inspection of Air-Purifying Respirators)

1. Air-purifying respirators shall be inspected by employees before each use and after cleaning for the following items:

   a. Rubber facepiece:

      Excessive dirt
      Cracks, tears, or holes
      Distortion of facepiece

   b. Head straps:

      (1) Breaks or tears
      (2) Loss of elasticity
      (3) Missing, broken, or malfunctioning buckles or straps
      (4) Excessively worn serrations on the head harness

   c. Inhalation and exhalation valves:

      (1) Detergent residue, dust particles, or dirt on valve or valve seat
      (2) Cracks, tears, or distortion of valves
      (3) Missing or defective valve covers

   d. Filter cartridges:

      (1) Proper filter
      (2) Missing or worn gaskets
      (3) Worn threads
      (4) Cracks or dents in filter housing

2. Correct deficiencies or notify supervisor, who will issue a new respirator.

Annex 17-9

MONTHLY PREVENTIVE MAINTENANCE FOR SUPPLIED-AIR RESPIRATORS

1. The following inspection shall be performed monthly by qualified personnel on the self-contained breathing apparatus. After each use, check for the following:

   a. Rubber facepiece:

      (1) Excessive dirt

      (2) Cracks, tears, or holes

      (3) Distortion of facepiece (allow facepiece to "sit" freely; if distortion does not disappear, replace facepiece)

      (4) Loose-fitting, cracked, or scratched facepiece

   b. Head straps:

      (1) Breaks or tears

      (2) Loss of elasticity

      (3) Condition of buckles

      (4) Worn serrations on head harness that would allow facepiece to slip

      (5) Fully extended in front of mask

   c. Corrugated breathing tube:

      (1) Cracks or holes

      (2) Missing or loose hose clamps

      (3) Broken or missing end connectors

   d. Harness:

      Straps in fully extended position

      All straps on unit

      Straps not torn or frayed

      Missing or broken buckles

   e. Air cylinder:

      (1) "Full" pressure reading on cylinder (if not full, refill tank)

      (2) Condition of tank

      (3) Date of last hydrostatic test (if over 5 years old, make arrangements to have test performed)

f. Air tightness:

With main line (yellow) closed, open cylinder valve to pressurize regulator and hose.

Place hand over regulator outlet and block it until leaktight.

Open main-line handwheel fully and observe the pressure gauge on the pressure demand regulator and compare to cylinder pressure.

Close the cylinder valve and observe regulator pressure gauge for drop in pressure. Remove hand from regulator outlet and check for function of audible alarm (375560 PSI). If leakage is noted or alarm malfunctions, remove unit from service and contact the District Safety Compliance Officer or ESRM.

g. Main-line and bypass valves:

(1) Test by donning the apparatus and operating normally.

(2) The regulator should follow the normal breathing pattern.

(3) Open bypass and ensure a rush of air is delivered to the facepiece.

h. Log inspection results.

i. If any unit is not ready for service, it should be tagged "DO NOT OPERATE."

2. Airline respirators used for periodic maintenance operations shall be inspected prior to each use as follows:

a. If the device is a tight-fitting facepiece, use the procedures outlined in Exhibit 11-8, except those relating to the purifying elements.

b. If the device is a hood, helmet, or blouse, use the following procedures:

(1) Examine for rips, tears, and seam integrity.

(2) Examine headgear, if appropriate, for general condition with emphasis on the suspension.

(3) Examine the face shield for cracks, breaks, or impaired vision.

c. Check air supply for:

(1) Integrity and condition of air-supply lines and hoses.

(2) Operation and condition of regulators, valves, or other air-flow regulators.

17.3.9. **Emergency Procedures (Supplied-Air Respirators).**

17.3.9.1. Appropriate respiratory protection will be utilized by certified users only upon entering contaminated atmospheres to perform rescue or maintenance operations.

17.3.9.2. When it is determined that rescue or emergency maintenance operations will be required on a process or in an area, suitable personal protective equipment will be provided for such purposes. The District Safety Compliance Officer or ESRM should be consulted to be sure this is done.

17.3.9.3. Emergency equipment shall be easily accessible to personnel but located outside the area in question.

17.3.9.4. Whenever operations require an individual to enter an *immediately dangerous to life and health* (IDLH) atmosphere wearing a supplied-air respirator for rescue or maintenance, standby personnel must be present wearing suitable rescue equipment. Standby personnel shall be in a position so that they would be unaffected by any toxic or oxygen-deficient atmospheres encountered.

17.3.9.5. Airline respirators may only be used in IDLH atmospheres in pressure-demand mode and with the use of an accessory egress bottle.

17.3.9.6. Additional safety equipment can be used (such as harnesses and safety lines for lifting and removing individuals) as needed. The requirements for this equipment shall be properly documented in emergency response procedures.

17.3.10. **Responsibilities of District Safety Compliance Officers or the ESRM.**

17.3.10.1. Document and maintain the respirator program on file.

17.3.10.2. Update the respirator program as needed.

17.3.10.3. Conduct or arrange for training and fit testing.

17.3.10.4. Certify and maintain on file a list of certified respirator users in the district and their certification forms (see Exhibit 11-4 above).

17.3.10.5. Conduct random inspections of all areas using respirators to ensure compliance with the program.

17.3.10.6. Decide the type of respiratory protection required.

17.3.10.7. Conduct periodic evaluations to determine the need for respirators on a continuous basis.

17.3.10.8. Provide OMC with pertinent information regarding potential respirator users.

17.3.10.9. Arrange for repair of respirators through the Supply Section.

17.3.10.10. Arrange for air measurements to be performed on all breathing-air compressors to ensure Grade D specifications.

17.3.10.11. Coordinate respirator certification of employees with the physician in the district who has agreed to administer the testing.

17.3.11. **Responsibilities of the Employee.**

17.3.11.1. Wear appropriate personal protective equipment (including respirators), as required, for performing assigned task.

17.3.11.2. Inform the supervisor of any health conditions that may be aggravated by the use of a respirator.

17.3.11.3. Store and maintain respirators in a clean, sanitary condition.

17.3.11.4. Report to the supervisor any maintenance needs of the respirators.

17.3.11.5. Clean and sanitize respirators after each use and return them to their storage location properly bagged and sealed.

17.3.11.6. Perform self-administered fit tests prior to using respirators.

17.3.11.7. Use only clean, assigned respirators that are in good condition.

17.3.11.8. Do not wear contact lenses while using a respirator.

17.3.12. **Responsibilities of Area Supervisors/Foremen.**

17.3.12.1. Interface with the District Safety Compliance Officer or ESRM regarding potential contaminants in the area.

17.3.12.2. Ensure that all respirator users are certified.

17.3.12.3. Ensure that employees maintain respirators in a clean, sanitary condition.

17.3.12.4. Ensure that only approved respirators are utilized by employees.

17.3.12.5. Maintain a list of respirator users in each department that includes the type of respirator used, dates of training, fit testing, and medical examinations.

17.3.12.6. Conduct frequent (daily/weekly) inspections of respirator storage areas, noting the condition of respirators.

17.3.12.7. Inform the District Safety Compliance Officer or ESRM of any changes in work place conditions or the addition of new employees who might be required to use respirators.

17.3.12.8. Stock and issue approved replacement cartridges for air-purifying respirators.

17.3.12.9. Return defective respirators to the Supply Section for repair or replacement.

17.3.12.10. Inform the District Safety Compliance Officer or ESRM of any future processes that may require the use of a respirator. Additionally, ensure that a respiratory protection program is maintained as required.

Compliance with this safety manual is mandatory for all ITD employees. The practices outlined in this manual are designed to keep ITD employees safe from injury while on the job. This content, procedures and best practices are gleaned from various industry standards. In the interest of keeping this manual short, some guidance and procedures are referenced to other outside sources including OSHA standards. This does not indicate that ITD follows OSHA in all instances, or that OSHA standards apply to the State of Idaho. Rather the references in this manual to some OSHA standards is merely an acknowledgment that in certain specific instances OSHA has identified and articulated the best guidance available as a best practice.

Questions, concerns or corrections to this manual should be directed to:

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ITD Employee Safety Manual