INTRODUCTION

ACCIDENT PREVENTION
No aspect of the BWL operations is of greater importance than accident prevention. The degree of safety and the results accomplished are directly proportional to the effort expended to control the conditions, practices, and human actions that are responsible for accidents.

PURPOSE
The purpose of this manual is to assist in the prevention and elimination of accidents.

EFFECTIVENESS
A. This manual shall be effective as of the date of issuance. Compliance by every employee is mandatory and is considered a requirement for employment.
B. Existing governmental codes, statutes, rules, and orders shall be considered a part of this manual and where any conflict exists between the two, those of governmental status shall prevail.

EMERGENCY CONDITIONS
In case of an emergency involving hazard to life, any Employee-in-Charge may modify or suspend any portion of this manual deemed necessary to permit proper handling of the specific emergency. Any person so acting shall be fully accountable for the reasonableness of their actions.

OCCUPATIONAL SAFETY AND HEALTH REQUIREMENTS
The BWL is responsible for employee compliance with all aspects of Occupational Safety and Health Act rules (or as modified by the state) and may be subject to severe penalties for violation of these requirements by any employee. As stated in the Occupational Safety and Health Act, “Each employee shall comply with the occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to their own actions and conduct.” Those employees who do not abide by the safety rules of this manual or other BWL safety requirements shall be subject to disciplinary action up to and including discharge.

EMPLOYEE-IN-CHARGE RESPONSIBILITIES
The Employee-in-Charge shall be responsible not only for their own safety but also for the safe work environment of other employees under their supervision. Before assigning work to an employee, the Employee-in-Charge shall ensure the employee knows and understands the hazards associated with the work and the proper procedures to perform the work safely. The Employee-in-Charge at all levels shall accept, in a cooperative manner, all reports of hazards, and an employee shall not be reprimanded or penalized for reporting hazards.

RESPONSIBILITY OF EMPLOYEES
Employees share with the employer the responsibility for safety. Each employee is responsible for their own safety, the safety of their co-workers, and the general public. Employees shall become familiar with and use all the protective devices, which are provided for their protection. Employees shall report all unsafe equipment, unsafe tools, and hazardous conditions that come to their attention to the Employee-in-Charge.
KNOWLEDGE OF SAFETY RULES
Every employee shall become thoroughly familiar with the contents of this manual as they apply to their work activities.

CONDITIONS NOT COVERED
Although each employee is primarily responsible for their own safety, in all instances where conditions are not covered by this manual or the job is not completely understood, the employee shall obtain specific instructions from an Employee-in-Charge before proceeding with the work.

QUALIFICATIONS FOR DUTY
Any Employee-in-Charge who has reasonable grounds (just cause) to suspect that an employee under their jurisdiction is either mentally or physically unfit for the work assigned shall prohibit such employee from working until satisfactory medical or other evidence indicating employee fitness is secured.

CARE IN PERFORMANCE OF DUTIES
Each employee shall use reasonable care in the performance of their duties and act in such a manner as to assure at all times maximum safety to themselves, their co-workers, and the public.
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EMPLOYEE RESPONSIBILITY

102.1 Every employee has a personal responsibility for safety. With this you also have the right and responsibility to stop a job when “Imminent Danger” exists. “Imminent Danger” (MIOSHA’s definition) means a condition or practice in a place of employment which is such that a danger exists which could reasonably be expected to cause death or serious physical harm, either immediately or before the imminence of danger can be eliminated though the enforcement procedures otherwise provided.

102.2 Before starting a job, satisfy yourself that you can perform the task without injury. A job briefing session shall be held before starting any job and each employee must be satisfied they can perform the task without injury.

102.3 Resolve your questions about the interpretation or application of a safety rule or procedure before continuing the job.

102.4 Do not operate tools or equipment without proper training.

102.5 Inspect all protective equipment, tools, and devices for damage or defects before using.

102.6 Learn and follow the BWL Safety Manual rules and the procedures.

102.7 Learn and follow any other standards adapted by the BWL Safety Committee.

102.8 Whenever necessary for safe job performance, ask the Employee-in-Charge to explain any safety rule, practice, or procedure.

102.9 Learn and follow the station operation procedures and the equipment they operate.

102.10 The final interpretation of a rule or procedure rests with the Safety Department or the BWL Safety Committee.

102.11 If you must work or inspect any premises alone, follow the process area’s specific safety procedures.

102.12 Perform all work procedures with due consideration for the safety of both fellow employees and the public.

102.13 When you identify a hazardous condition, report it to the Employee-in-Charge. Complete a Near Miss/Hazard Report Form.

102.14 Report promptly to Employee-in-Charge any personal condition that may impair work performance or anyone’s safety.

102.15 Being under the influence of or the use of intoxicating beverages or drugs on BWL premises or on the job or during working hours is prohibited and shall be sufficient cause for disciplinary action. Any employee taking drugs prescribed by a physician or over the counter drugs that could impair assigned work shall report this to the Employee-in-Charge.

EMPLOYEE-IN-CHARGE

103.1 The Employee-in-Charge shall be responsible for the consistent enforcement of all safety rules and practices.

103.2 The Employee-in-Charge shall consider hazards or conditions that could arise during a job.

103.3 The Employee-in-Charge shall hold a job briefing with the employees involved before they start each job. The briefing shall cover at least the following subjects: hazards associated with the job, work procedures involved, special precautions, energy source controls and personal protective equipment requirements.

Number of Briefings: The number of briefings will vary. If the work or operations to be performed during the work shift is repetitive and similar, at least one job briefing shall be conducted before the start of the first job on
each shift. Additional job briefings shall be held if significant changes occur during the course of the work which might affect the safety of the employees. The amount of detail necessary in the briefing will be determined by the complexity and hazardous conditions to be encountered and the experience and familiarity with these conditions by the employees performing the work. An employee who is working alone should plan the work carefully and review hazards prior to beginning work. If unfamiliar or uncomfortable with the specific job or situation, it should be discussed with the Employee-in-Charge. Documentation shall be maintained on hard copy for two years. If possible, use daily time slips for documentation.

103.4 The Employee-in-Charge shall take immediate action to prevent an unsafe procedure or to correct a hazardous condition.

103.5 No employee shall sacrifice safety for time or speed on a work project.

103.6 The Employee-in-Charge shall assure that each employee has been instructed in the safe operation and procedure of all tools and equipment needed to perform a job.

103.7 The Employee-in-Charge shall be responsible for communicating with other crews or process areas as required by these rules.

104 CONTRACTORS AND VISITORS

104.1 Visitors shall be informed by an authorized BWL employee of identified hazards of the equipment or work location. Visitors shall also be informed of the site Emergency Action Plan.

104.2 Contract employees working for the BWL shall be oriented in the safety procedures applicable to the location where the contractor is working before starting the work. Contractor orientation shall follow the guidelines presented in the BWL Contractor Safety Program.

104.3 No representation shall be made that all hazards have been identified or that the work place is guaranteed in a safe condition.

104.4 Contractors shall comply with all applicable federal and state regulations and BWL safety rules and programs relevant to the work performed.

104.5 The contractor shall be responsible for establishing control measures to protect their employees, and/or employees under their control, from exposure to hazards present at the work location.

104.6 Any contractor safety violation, personnel injury, near miss or hazard shall be reported to the BWL Employee-in-Charge or the Contract Coordinator immediately.

104.7 The Employee-in-Charge or Contract Coordinator shall report to the Safety Department any contractor safety violation, injury, near miss or hazard by completing an injury or near miss/hazard report form.

105 FIRE PROTECTION AND PREVENTION

105.1 A fire in the beginning stage (incipient) may be combated by qualified employees with available and appropriate fire extinguishers if deemed safe to do so and if the following criteria are met:

A. Fire is small and confined.
B. Fire can be fought with the employee’s back toward a non-threatened escape.
C. The extinguisher’s class matches the type of fire involved.
D. The extinguisher works effectively.
When a fire is detected, it shall be immediately reported to the Employee-in-Charge and employees shall evacuate the facility, if deemed necessary.

The local fire department shall be called for all interior structural fires or fires deemed uncontrollable using available fire extinguishers or any other suitable fire extinguishing equipment.

Signs shall be posted forbidding open flames in all areas containing fast burning combustible material, flammable liquids, and flammable vapors and gases. Examples of such areas include, but are not limited to, various areas in garages, coal handling areas, oil storage rooms, fuel tanks and dispenser areas, and hydrogen storage areas.

Open flames or spark-generating devices (matches, torches, welding equipment, grinders, etc.) shall not be used in any posted location.

Fire extinguisher training shall be provided for any employees expected to operate portable fire extinguishers. This training shall be provided upon initial assignment and then at least once a year.

Portable fire extinguishers shall be supplied at all BWL facilities.

Portable fire extinguishers shall be located where they will be readily seen and accessible. Obstructions such as material or tools shall not block the view or use of the extinguishers.

Stairways and doors that are used for fire egress shall be free of all obstructions or impediments. Doors shall open outward with the exit travel and fire exit doors shall never be locked or chained closed.

An assigned location shall be determined for any used, partially used, or defective extinguishers and any such extinguishers shall be reported to the Employee-in-Charge.

Portable fire extinguishers shall have documented monthly visual inspections to make sure they:

A. Are in designated place.
B. Have not been actuated or tampered with.
C. Do not have any obvious damage.

Portable fire extinguishers shall receive a thorough annual mechanical inspection by a licensed fire protection contractor to ensure operability.

Dry pipe fixed fire protection systems shall have weekly visual inspections to make sure they have adequate water/air pressure.

All fixed fire protection systems with isolation valves shall have those isolation valves chain locked in the open position.

Fixed fire protection systems shall be inspected annually by an authorized employee or outside service.

Fixed fire protection systems shall have an annual main drain flow test and the test valve open once every two years to check system operation.

Fixed fire protection system sprinkler heads shall not be painted over; and painted sprinkler heads shall be replaced.

Hot Work Permits shall be required for any work process involving open flame or producing heat and/or sparks, with the exception of areas such as welding booths specifically designed to control any heat or sparks.

A. Employees coordinating and/or planning the work are responsible for obtaining the permits.

B. Hot work activities performed in the field or outside BWL buildings may not require a permit as determined by the Employee-in-Charge. However, the work area shall be inspected for fire hazards and a fire extinguisher shall be readily available.
105.19 Employees performing Hot Work shall be trained on requesting and completing a permit, methods to identify potential fire situations, and the facility emergency communication procedures.

105.20 The completed Hot Work Permit shall be displayed in the work area for the duration of the Hot Work, and during each shift the Hot Work continues.

105.21 An area of at least 35 feet around a Hot Work operation shall be prepared prior to starting the job to mitigate any potential fire hazards.
A. Combustible and flammable substances shall be removed, relocated, guarded, shielded, or covered with fire-resistant material.
B. Cracks or openings through which sparks could pass in the floor or walls to adjacent areas shall be covered with a fire-resistant material.
C. Ductwork and duct openings shall be sealed, guarded, or covered with fire-resistant material.
D. Conveyor systems that might carry sparks to distant combustibles shall be protected or shut down.

105.22 Fire Watch shall be assigned for the duration of the Hot Work and for one hour after the Hot Work has been completed. A fire extinguisher shall be readily available at the Hot Work site.

105.23 Intermittent area observation for up to an additional three hours after the one-hour fire watch may be required depending on job characteristics.

106 EMERGENCIES

106.1 It is the responsibility of all BWL employees to report any type of emergency to the Employee-in-Charge for the safety and protection of BWL employees, customers and facilities. Examples of emergencies include, but are not limited to, natural disasters, fire emergencies, chemical spill or release, catastrophic event, bomb threat, etc.

106.2 The BWL Emergency Action Plan shall be periodically reviewed with employees for appropriate responses in case of emergency.

106.3 Occupants of BWL buildings shall be given instructions on building evacuation procedures.
A. The Employee-in-Charge shall instruct BWL employees, visitors and contractors on area evacuation procedures.
B. Building or area evacuation procedures shall be reviewed with all employees at their initial departmental orientation and periodically thereafter.
C. Evacuation and take cover procedures specific to meeting room shall be explained to all attendees before each meeting or gathering.
D. Building or area evacuation procedures shall be posted.

106.4 Periodic drills shall be held in each BWL department or area for fire, adverse weather conditions and/or other emergency response actions.

106.5 In case of a chemical spill or release, employees shall:
A. Immediately notify the Employee-in-Charge or area supervisor and Environmental Services Department. Provide as much information as possible such as:
   1. Exact location of spill.
   2. Type and source of spilled material based on information from labels, placards, etc.
   3. Approximate amount or area affected.
   4. Exposed personnel.
B. Refrain from attempting to control and/or stop the chemical spill or release unless trained and certified to do so.

C. Evacuate the affected area immediately in case of large spills or releases.

BWL employees shall obtain specific instructions from the Employee-in-Charge or supervisor for emergency situations not covered in the Emergency Action Plan before proceeding with the work.

107 INJURY REPORTING AND INVESTIGATION

107.1 All injuries shall be reported to the Employee-in-Charge immediately.

107.2 Injury Response Actions.

A. Immediate medical treatment of injured persons; including calling 911 if required.

B. Secure and stabilize the accident site – shut down equipment or power sources if necessary. Cordon off the area.

C. Immediately communicate (verbal/voice mail, cell phone) all serious injuries involving medical treatment, emergency response or medical transport to the Employee-in-Charge, Area Manager, Safety Department, Human Resources, and Union Safety Director.

D. Identify possible witnesses.

E. Notify Environmental Services if a release of hazardous materials is suspected.

107.3 Safety Department or Human Resources shall make all regulatory required contacts and reporting.

107.4 The employee shall complete the BWL Incident Report Form by the end of the shift. If the employee is unable to complete the form by the end of the shift due to the nature or extent of the injuries, the Employee-in-Charge shall complete as much of the form as possible.

107.5 The Employee-in-Charge shall:

A. Immediately investigate the incident using the Employee-in-Charge Investigation Form.

B. Involve a trained bargaining unit co-investigator where applicable.

C. Ensure that the following forms have been completed and sent to the Safety Department within 24 hours:

1. The Incident Report Form.
2. Witness Statement Form(s).
3. Employee-in-Charge Investigation Form.

107.6 The Safety Department shall:

A. Review the completeness of the Employee-in-Charge Investigation Form.

B. Determine whether a more comprehensive investigation is needed.

C. Notify the Manager of the injured employee of the above decision.

D. In collaboration with the Manager, assign an investigation team if necessary. The investigation team:

1. Shall be made up of not less than two trained persons.
2. Consists of bargaining and non-bargaining where applicable.
3. Members may be internal or external to the RA.
4. May be assisted by the Technical and Safety Trainer, Union Safety Director and Safety Department.

107.7 All Injury Reports shall be investigated.

A. The investigation shall begin immediately after emergency response actions have been completed and the Manager has been notified of the injury.
B. When an injury results in medical treatment, restrictions or lost time the Investigation Report shall include a root cause analysis.

107.8 The Comprehensive Investigation Report shall be completed and sent to Safety Department within 15 calendar days of the review date.
A. Safety Department will review the report for completeness and forward the report to the respective Managers and Directors for final signature.
B. Safety Department will distribute final report copies to the employee, Union Safety Director, and Human Resources.
C. An extension of the investigation period may be granted by the Director of Safety or his designee after a written request by the Manager.

107.9 An employee may appeal an Injury Investigation Report.
A. Employee contacts the Director of Safety or Union Safety Director.
B. The Director of Safety and Union Safety Director will review the original Investigation Report and contact the employee and investigators for additional information.
C. The Director of Safety and Union Safety Director will work with the employee and investigators to resolve any differences. An amended report shall be issued to document the appeal.

107.10 Each Responsibility Area (RA) shall have trained incident investigators.
Safety Department shall be responsible to maintain a current list of all trained investigators, training content, information and procedures.

108 NEAR MISS/HAZARD REPORTING AND INVESTIGATION

108.1 A Near Miss/Hazard can be initiated by individual employees, work crews, department Safety Advisory Committees, or management.
A. A Near Miss or Hazard shall be reported to the Employee-in-Charge immediately.
B. The employee shall complete the BWL Incident Report Form by the end of the shift.

108.2 Imminent danger hazard response actions.
A. Immediately secure the area.
B. Immediately report all imminent danger situations to the Employee-in-Charge.
C. Notify Environmental Services if a release of hazardous materials is suspected.

108.3 The Employee-in-Charge shall:
A. Investigate the incident using the Employee-in-Charge Investigation Form.
B. Involve a trained bargaining unit co-investigator where applicable.
C. Ensure that the following forms have been completed and sent to the Safety Department within 24 hours:
   1. The Incident Report Form.
   2. Witness Statement Form(s).
   3. Employee-in-Charge Investigation Form.

108.4 All Near Miss/Hazard Reports shall be investigated.
A. The investigation shall begin immediately after any immediate response actions have been completed.
B. When an incident results in property damage, or when requested by management, the Investigation Report shall include a root cause analysis.

108.5 The Safety Department shall:
A. Review the completeness of the Employee-in-Charge Investigation Form.
B. Determine whether a more comprehensive investigation is needed.
C. Notify the Manager of the employee who submitted of the above decision.
D. In collaboration with the Manager, assign an investigation team if necessary. The investigation team:
   1. Shall be made up of not less than two trained persons.
   2. Consists of bargaining and non-bargaining where applicable.
   3. Members may be internal or external to the RA.
   4. May be assisted by the Technical and Safety Trainer, Union Safety Director and Safety Department.

108.6 The Comprehensive Investigation Report shall be completed and sent to Safety Department within 15 calendar days of the review date.
A. Safety Department will review the report for completeness and forward the report to the respective Manager and Director for final signature.
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A. Employee contacts the Director of Safety or Union Safety Director.
B. The Director of Safety and Union Safety Director will review the original investigation report and contact the employee and investigators for additional information.
C. The Director of Safety and Union Safety Director will work with the employee and investigators to resolve any differences. An amended report shall be issued to document the appeal.

108.8 Each Responsibility Area (RA) shall have trained incident investigators. Safety Department shall be responsible to maintain a current list of all trained investigators, training content, information and procedures.

109 PUBLIC INJURY
109.1 In the event of a public injury, the area manager and the BWL Security Coordinator shall be immediately notified.
109.2 All available information about the incident shall be promptly gathered. The names, addresses, and telephone numbers of the aggrieved, injured, and all witnesses shall be obtained and recorded.
109.3 The BWL General Public Incident Report form shall be completed and forwarded to the Enterprise Risk Management and Safety Departments.
109.4 If the incident involves a vehicle owned, leased or rented by the BWL or a personal vehicle used for BWL business, the BWL Vehicle & Equipment Accident Report form shall be completed. The instructions on the back of the form shall be followed.
109.5 The BWL Vehicle & Equipment Accident Report form shall be routed to Enterprise Risk Management, Fleet Services and Safety Departments.
109.6 All motor vehicle accidents shall be reported to the appropriate police agency.

110 CUSTOMER PREMISES
110.1 Do not attempt to walk or work in the dark.
110.2 Use a flashlight when other source of light is inadequate.
110.3 Dog bites or any other injury shall be reported to the Employee-in-Charge immediately.
110.4 The employee and the Employee-in-Charge shall file a report with Animal Control for all dog bites.
110.5 All hazards around customers' premises shall be shown on the hand-held computers (S.S.I.s).
110.6 Meter readers shall notify the process area in writing, on hazard cards, or by BWL radio so that new hazard information may be properly updated.
110.7 Do not use makeshift platforms or ladders such as chairs, boxes, wheelbarrows, etc. to read meters.
110.8 Meter readers shall not jump or climb over fences or hedges.
110.9 When approaching or working on customer property, employees shall watch for tripping hazards, defective stairs, and the presence of dogs, cats, or other potentially dangerous animals.
110.10 Meter readers shall stay at least 10 feet away from switchboards where meters are located behind uncovered bus bars, cables, etc.

111 HOUSEKEEPING
111.1 Work locations and both the inside and outside of vehicles and buildings shall be kept clean and orderly at all times.
111.2 Combustible materials such as oil-soaked rags, waste and shavings shall be kept in approved metal containers, with metal lids. Containers shall be emptied daily.
111.3 Paper and other combustible materials shall not be allowed to accumulate.
111.4 Weeds and other range vegetation shall not be allowed to grow in or around substations, pole yards, buildings, oil tanks, or other structures.
111.5 During the course of construction, alteration or repairs, scrap lumber with protruding nails and all other debris, shall be kept cleared from work areas, passageways and stairs, in and around buildings and other structures.
   A. Combustible scrap and debris shall be removed at regular intervals during the course of construction.
111.6 The escape of dust from process equipment or ventilation systems shall be minimized.
111.7 Coal dust residues shall be cleaned at regular intervals.
   A. Cleaning methods shall not generate dust clouds.
   B. Only vacuum cleaner approved for combustible dust collection shall be used.
   C. Open and hidden areas shall be inspected for dust residues at regular intervals.
111.8 Where the type of operation produces slippery conditions, mats, grates, cleats or other methods shall be used to eliminate slipping hazards.
111.9 Floors, platforms, stairways, aisles, roadways, walkways and material storage areas shall be kept clear from obstructions, debris and any slip hazards.
   A. Eyewash/shower stations, compressed gas cylinders and fire extinguisher areas shall be kept clear from obstructions.
111.10 Snow and ice shall be removed from walkways.
111.11 Spilled grease and oil shall be immediately wiped up or absorbed using absorbent material to minimize a slipping hazard.
111.12 Drip pans shall be installed where oil, water or other liquid drips cannot be corrected.
111.13 Broken glass and sharp metal objects (such as banding materials) shall be promptly wrapped and disposed.
A. Puncture-resistant gloves shall be worn when handling rough and sharp materials.

111.14 Precautions shall be taken when working in elevated positions to prevent objects from falling on people below.

111.15 Materials and supplies shall be stored in an orderly manner to prevent their falling or spreading, and to eliminate a tripping hazard.

111.16 Materials and supplies shall not be stored near energized panels or equipment.
   A. Minimum distance of three feet shall be kept from control panels, fuse boxes, switchgear, energized wire, and fire suppression equipment.

111.17 Open flames or smoking shall not be allowed where flammable liquids are stored. Appropriate warning signs shall be posted in these areas.

111.18 In any building, except one provided for its storage, no more than 25 gallons of flammable or combustible liquid shall be stored in a room outside of an approved storage cabinet.
   A. No more than 60 gallons of Class I or Class II liquids and no more than 120 gallons of Class III liquids may be stored in a storage cabinet.
   B. No more than three such cabinets may be located in single storage area.
   C. Quantities in excess of these amounts shall be stored in an inside storage room designed for storage of flammable and combustible liquids.

111.19 Barrels or drums shall be stored in racks designed for storage.

111.20 Parts or materials shall be stored on shelves or bins without interfering, endangering, or causing hazards for persons working in the area. Do not store parts or materials:
   A. On top of bins.
   B. On shelves that create a hazard when removing the material.
   C. On shelving not designed for the weight or size of the material, with the material protruding from the shelf.
   D. Allowing the contents of open boxes or cartons from dropping or spilling when removing from storage bins.

111.21 Bins or shelves shall not be used as ladders. Bins and shelves shall be assembled, erected, and secured to avoid their tipping.

112 WORK AREA PROTECTION

112.1 Use adequate lighting at all work locations.

112.2 Flashlights shall be used until lighting is provided.

112.3 Never use open flames or matches for lighting.

112.4 Use warning devices to warn and protect the public and employees from operating equipment and other hazards.

112.5 Warning devices and equipment shall be removed as soon as the hazard is eliminated. Warning devices and equipment not in use shall be stored in a proper manner or shall be removed from the work area.

112.6 Before starting work, the Employee-in-Charge shall inspect the area to be sure that the protection is adequate.

112.7 Whenever possible, remove heavy concentration of dust and foreign material and adequately ventilate the work area. If not possible, use the appropriate breathing apparatus or respirators.

112.8 Only authorized persons shall be permitted in a work area.

112.9 Any barriers opened shall be immediately restored.
112.10 Area levels below an open work area shall be guarded from falling objects, welding sparks, welding rod, and waste materials by providing a suitable covering (such as plywood sheets or canvas, etc.) for the opening.

112.11 Work area protection shall be accomplished by the use of good, approved, informative, and protective devices such as tape, fencing, signs, flags, traffic devices, and barricades.

112.12 The public and other BWL employees must be warned in advance. Regulate and guide them safely through or around the work area.

112.13 Avoid using sidewalk or streets for the temporary storage of tree limbs or material.

112.14 Employees below any work level shall remain clear and be alert to falling objects.

112.15 When construction requires the installation of heavy equipment or materials which may constitute a hazard in the judgment of the crew, the weight of the equipment or materials and the actual load capacity of the lifting device (winch, crane, etc.) shall be determined. The weight of the equipment or materials shall not exceed the actual load capacity of the lifting device.

113 OFFICE SAFETY

113.1 Open doors slowly to avoid striking anyone on the other side.

113.2 Door openings shall never be blocked by any object.

113.3 Keep to the right when walking, particularly at blind corners.

113.4 Employees shall walk cautiously up and downstairs; the handrail shall be used whenever possible.

113.5 Pointed objects such as pencils, knives or scissors should not be carried with the point exposed.

113.6 Do not run in aisles or corridors.

113.7 Boxes, chairs, etc., shall not be used in place of an approved ladder.
   A. Material shall be stored on shelves in a manner to prevent falling; heavy objects shall be placed on lower shelves.
   B. All emergency exits and emergency equipment such as fire extinguishers and fire hose racks shall be kept clear of all obstructions.
   C. Unsafe electrical cords, faulty electrical or other equipment, or any other hazardous condition shall be reported to the Employee-in-Charge.

113.8 Do not lean back or sideways on chairs or stools to a point where all legs or casters are not in contact with the floor.

113.9 Open only one drawer at a time to prevent tripping over the file cabinet.

113.10 The tops of file cabinets shall be kept clear of any loose items or material, such as catalogs or manuals, which may fall if not properly contained.

113.11 Cords for electrical equipment shall not be strung across walkways or aisles where people may trip over them.

113.12 Appropriate guards shall cover exposed moving parts or power-driven office machines at all times while connected to the power source.

113.13 All power-operated office machines shall be grounded through the use of a three-wire cord and outlet or by a separate ground wire. Any defects in cords or machines shall be promptly reported and repaired.

113.14 Hand-operated paper cutters shall be equipped with a guard to keep fingers away from the cutting surface.

113.15 The cutting knife of a paper cutter shall never be left raised while unsupported; it shall always be closed and hooked when not in use. $700.00 MIOSHA fine if found in violation.
113.16 Broken glass and other sharp objects shall not be placed in waste paper containers. They shall be put in special baskets or containers, provided for their disposal.

113.17 Common or sharp-pointed pins shall not be used for fastening paper together. Staples, paper clips or other approved fasteners shall be used.

114 VIDEO DISPLAY TERMINALS
114.1 Employees using video display terminal for extended periods of time shall consider the following:
   A. Keep back straight with feet resting firmly on the floor for support.
   B. Use a back-support cushion for lower back.
   C. Position video display terminal so the operator's eyes are level with the top of the screen.
   D. Adjust the height of the chair or keyboard so that shoulder-elbow-arm angle is at 90 degrees.
   E. Use a cushioned wrist rest to keep user's hand and fingers in the same plane as the forearm.
   F. Video display terminal users shall adjust position frequently to avoid muscle stiffness.

115 ELEVATORS
115.1 Follow posted operating instructions.
115.2 When being serviced and when being used to transport large and bulky materials, appropriate Clearance and tagging procedures shall be followed.
115.3 Long material should not protrude through any roof openings of the elevator car.
115.4 Defective and/or improper operating elevators shall be promptly reported and removed from service.

116 EXCAVATION, BORING AND TUNNELING
116.1 Follow the “MISS DIG” staking request procedures prior to excavating.
116.2 The Employee-in-Charge shall advise all the crew, in the job briefing discussion, available information that relates to the depth and location of underground obstruction.
116.3 Pile soil at least two feet away from the edge of the trench.
116.4 Augering motors shall not be operated while employees are near the auger flights.
116.5 Detach the air supply before placing or removing the boring equipment from the trench.
116.6 Before operating, verify that the air supply lines are secured to the equipment and that all safety pins are in place.
116.7 When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means, usually by hand digging with an approved insulated tool and the use of suitable gloves.
116.8 If electrical cables are damaged, the following steps shall be taken:
   A. If the damaged cable belongs to a utility other than the one performing the work, this utility shall be notified at once.
   B. The area shall be barricaded, and the public kept out until hazardous conditions can be eliminated.
116.9 If gas lines are damaged, the following steps shall be taken as soon as possible:
A. Do not attempt to repair or stop the leak.
B. The hole shall be left open to allow the gas to dissipate into the atmosphere. All possible source of igniting the gas shall be removed or eliminated.
C. Residents of the area shall be warned when necessary, and the public kept out of the area.
D. The local fire department shall be notified immediately, if needed.
E. The gas company shall be notified at once.

116.10 If communications cables are damaged, the communications company shall be notified at once.

116.11 While excavation is open, all underground installations shall be protected, supported, or removed to safeguard employees.

116.12 A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are four feet or more in depth so as to require no more than 25 feet of lateral travel for employees. Ladder must extend above the trench a minimum of three feet.

116.13 Employees exposed to vehicle traffic refer to Section 352 of this safety manual.

116.14 No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

116.15 When mobile equipment is operated adjacent to an excavation and the operator does not have a clear and direct view of the edge of the excavation, a warning system such as barricades, a spotter, or stop logs shall be utilized. If possible, the grade should be away from the excavation.

116.16 Employees shall not work in excavations in which there is accumulated water or in excavations in which water is accumulating unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a body harness and lifeline.

116.17 If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation.

116.18 Where the stability of adjoining building, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided.

116.19 Employees shall be protected from excavated material or equipment that fall or roll into excavations. Protection shall be provided by placing and keeping such materials or equipment at least two feet from the edge of excavations or by the using of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into the excavation.

116.20 Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted before starting work and as needed throughout the shift.
Inspections shall also be made after every rainstorm. Where the competent person finds evidence of a situation that could result in a possible cave-in, failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

116.21 Where employees or equipment are required or permitted to cross over excavations, walkways or bridges with standard guardrails shall be provided.

116.22 When excavations are left open, warning devices, barricades, fencing, or guardrails shall be placed to adequately protect the public and employees.

116.23 At the end of each workday, as much of the excavation as practical shall be closed. No more trench shall be open at one time than is necessary.

116.24 Mechanical excavating equipment that is parked or operating on streets or highways shall be protected by proper warning devices.

116.25 When it is necessary to leave excavating equipment unattended, the blade, bucket, or scoop shall be lowered to the ground and the ignition system locked.

116.26 Each employee in an excavation shall be protected from cave-ins by an adequate protective system, either sloping or benching, or by a shoring or shield system, unless excavations are made entirely in stable rock or are less than five feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

116.27 When choosing a protective system, a competent person shall take into consideration soil type, vibration sources, previously disturbed soil, layered soil, presence of water, heavy equipment work adjacent to the excavation, limit work area, and other hazard-increasing conditions.

116.28 Shoring and shield systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the shoring or shield system.

116.29 Removal of shoring systems shall begin at and progress from the bottom of the excavation. Members shall be released slowly so as to note any indication of possible cave-ins of the side of the excavation or possible failure of the remaining members.

116.30 Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of a sudden lateral load.

116.31 Employees shall be protected from the hazards of cave-ins when entering or exiting the areas protected by shields.

116.32 Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

116.33 Sloping or benching, shoring or shielding for excavations greater than 20 feet deep shall be designed by a registered professional engineer. Refer to Table 8.1 for soil type maximum slope requirements for excavation less than 20 feet.
### Table 8.1
Maximum Allowable Slopes for Excavations Less Than 20 Feet Deep*

<table>
<thead>
<tr>
<th>Soil or Rock Type</th>
<th>Maximum Allowable Slopes (H1V)'em**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Rock</td>
<td>Vertical (90 deg)</td>
</tr>
<tr>
<td>Type A ***</td>
<td>¾:1 (53 deg)</td>
</tr>
<tr>
<td>Type B</td>
<td>1:1 (45 deg)</td>
</tr>
<tr>
<td>Type C</td>
<td>1:1/2:1 (34 deg)</td>
</tr>
</tbody>
</table>

Notes:
* Splaying or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.
** Numbers in parentheses are angles expressed in degrees from the horizontal. Angles have been rounded off.
*** A short-term maximum allowable slope of 1/2H:1V (63 deg) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.56 m) in depth shall be 3/4H:1V (53 deg).

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### 117 EXPLOSIVES

117.1 Explosive materials shall only be used by BWL employees for well cleaning. All other uses are prohibited.

117.2 This section does not apply to powder-actuated tools.

117.3 Trained and Qualified Employees.
   A. Only persons authorized by the BWL shall use explosives or explosive material.
   B. Employees handling, using and firing explosives shall be qualified by training and experience in the safe handling, transporting, storing, and use of explosives and shall have a working knowledge of applicable federal, state, and local laws.
   C. A minimum of two trained and qualified employees shall be assigned to supervise employees assigned to handling explosives.

117.4 Storing Explosive Materials.
   A. All explosive material shall be stored and maintained in a secured storage building.
   B. Blasting caps and primer shall be stored in separate locations.
   C. Ground around magazines shall slope away for drainage. The land surrounding the storage building shall be kept clear of brush, dried grass, leaves, and other materials for a distance of at least 25 feet.

117.5 Transportation of Explosives.
   A. Motor vehicles containing explosives or blasting agents shall be attended at all times.
   B. Explosives and detonators shall be carried and transported in the original manufacturer’s container or other approved container.
   C. Explosive and blasting caps (detonators) shall not be transported on the same vehicle.
   D. Blasting supplies shall not be transported with other materials and cargoes.
E. Vehicles transporting explosives, detonators, and other blasting supplies shall have all exposed spark-producing metal on the inside of the body covered with non-sparking material.
F. Vehicles shall be marked and placarded according to DOT regulations.
G. Vehicles shall have fire extinguishers in good mechanical condition.
H. Vehicles containing explosives, blasting agents, or blasting supplies shall not be taken inside a garage or shop.
I. No repairs shall be performed on a vehicle loaded with explosives, blasting agents, or blasting supplies.

117.6 Preparing the Site.
A. The site shall be secured and barricaded to prevent unauthorized entry.
B. When electric blasting caps are used, adequate signs warning against the use of mobile radio transmitters shall be prominently displayed.
C. A seismograph shall be in place before blasting.
D. Prior to connecting the charge or initiating the explosives, the blaster shall ensure the protection of the public and BWL employees through the use of warning signs and/or personnel stationed around the perimeter of the danger area.

117.7 Preparing the Blasting Materials.
A. Electrical connections shall be made only after the well has been charged and the area is clear.
B. Blasting cap leg wires shall be kept short-circuited (shunted) until they are connected into the circuit for firing.
C. Before the blast is fired, a loud signal shall be given by the blaster who shall have made certain the area is clear of persons and extraneous materials.

117.8 Misfires.
A. No person shall return to the blast area until permitted to do so by the blaster.
B. Misfires shall not be inspected until a sufficient waiting period has elapsed.
C. If there is a miss fire, the charges shall stay in place and a small booster charge shall be used to blow the misfired charge.

117.9 After the Blast.
A. The area must be ventilated to remove all blasting fumes before employees can enter the area.
B. Air monitoring is required prior to entering a well house after blasting.

118 BOAT AND WATER SAFETY
118.1 Boats, barges, and dredges shall be operated by qualified employee(s). Employees shall report to the Employee-in-Charge any damaged or unsafe flotation devices.
Use substantial boats not canoes or rafts when necessary to cross or work upon bodies of water where wading is undesirable, impractical or impossible.
Do not exceed the rated capacity of the craft with the combined weight of tools, equipment and personnel.
Do not transport large tools (ladders, etc.) in the same boat with groups of workers. Use a separate boat or make additional trips.
Each dive team member shall be qualified to perform assigned tasks in a safe and healthful manner.
Each dive team member shall be trained in emergency procedures, cardiopulmonary resuscitation and first aid (American Red Cross standard course or equivalent). All dive team members shall be assigned tasks in accordance with the employee’s experience or training, except that limited additional tasks may be assigned to an employee undergoing training provided that these tasks are performed under direct supervision of an experienced dive team member.

118.2 During refueling, all fires, smoking, etc. shall be extinguished in the immediate area and a fire extinguisher shall be available.

118.3 Life rings shall be available at BWL structures near the water where drowning hazards exist.

118.4 Your weight should be placed as near the center line of the boat as possible when boarding.

118.5 An anchored light shall be provided for watercraft, and shall provide 360 degree visibility.

119 ADVERSE WEATHER CONDITIONS

119.1 BWL employees should review and be familiar with the BWL Emergency Action Plans and area-specific action plans regarding the appropriate response to inclement or adverse weather conditions. Adverse weather conditions include, but are not limited to, tornados, thunderstorms, high winds, snow storms, ice storms, etc.

119.2 It is the responsibility of all BWL employees to notify the Employee-in-Charge of inclement or adverse weather conditions.

119.3 The Employee-in-Charge shall make the determination whether adverse weather conditions have the potential to make field or outdoor work hazardous.

119.4 Outdoor or field work shall be discontinued or altered in the presence of adverse weather conditions, except in the case of emergency restoration.

119.5 Outdoor work shall not be permitted when thunderstorms are in the immediate vicinity.

119.6 Work involving the possibility of electrical shock shall not be permitted during heavy precipitation, except in the case of emergency restoration.

119.7 Outdoor work on equipment such as bucket trucks, aerial lifts, etc., shall be performed in accordance with manufacturer’s guidelines for high wind conditions.

119.8 At no time shall outdoor elevated work be permitted in the presence of winds at or exceeding 40 miles per hour.

119.9 Employees working outdoors shall identify take shelter areas when receiving notification of adverse weather conditions.
   A. Shelter areas include sturdy buildings, basements, etc.
   B. Employees should go to identified shelter area as soon as possible.
   C. Employees exposed to adverse weather conditions in a shelter area should try and maintain communications with the Employee-in-Charge and/or with BESOC to update their situation periodically.

120 MAIL AND PACKAGE ORDERING AND RECEIVING

120.1 Only the BWL’s official U.S. Postal Service mailing address shall be used for mail and small package delivery and in electronic exchanges such as email signature blocks:
120.2 Private courier (UPS, DHL, FedEx, etc.) deliveries shall be routed to BWL Purchasing and Warehousing:
Lansing Board of Water & Light
Purchasing and Warehousing
1110 S. Pennsylvania Ave.
Lansing, MI 48912

120.3 Mail and packages coming into the BWL shall be for BWL business only and shall be processed in accordance with 1112 MAIL AND PACKAGE RECEIVING.

151 CONFINED SPACES

151.1 Lansing Board of Water and Light shall maintain a written Confined Space Entry Program. The written program shall provide guidelines for hazard assessment, confined space classification, employee training, and entry procedures.

151.2 Each Process shall classify and maintain a list of all confined spaces, including field and fixed facilities, which employees could be expected to enter.

151.3 Where possible all Permit Required confined spaces shall be labeled by a sign that reads “Permit Required Confined Space – Do Not Enter”.

151.4 Training.
   A. Employees shall be trained on the hazards and procedures associated with confined spaces prior to any entry or work assignment in a confined space.
   B. Refresher training shall occur whenever there is a change in assigned duties, a change in the confined space that presents a new hazard, or a change in the initial entry conditions.
   C. Entry into a Permit Required Confined Space requires that employees be trained as Entry Attendants, Authorized Entrants, and/or Entry Supervisors.

151.5 Rescue Plan.
   A. A rescue plan shall be established prior to entering a Permit Required Confined Space.
   B. Rescue personnel shall be First Aid and CPR certified.

151.6 Prior to Entering a Confined Space.
   A. Confined Space Entry Permit or Certification.
      1. A written Confined Space Entry Certification shall be completed by the Employee-in-Charge prior to entry into a Non-Permit or Alternate Entry Confined Space.
      2. A written Confined Space Entry Permit shall be completed by the Entry Supervisor prior to entry into a Permit Required Confined Space.
      3. The Entry Certification or Confined Space Entry Permit shall be posted at the confined space entrance.
   B. If the space cannot be entered safely, DO NOT ENTER the space. Immediately contact the Employee-in-Charge.
   C. Where possible, all electrical and mechanical energy sources shall be physically rendered inoperative, locked, and/or tagged out.
   D. Emergency procedures shall be reviewed.
E. Communication procedures and method of communication shall be verified, and instructions maintained at each entry location.
F. Before any entrance cover or hatch is removed, it shall be determined that there is no temperature, pressure, or hazardous condition that may injure the employee(s) opening the space.
G. All levels of the space shall be tested for oxygen, carbon monoxide, flammable, and toxic gases.

151.7 Air Monitoring.
A. If at any time during the entry the monitor indicates an unsafe environment, all entrants shall leave the space immediately.
B. Continuous atmospheric monitoring shall be conducted at the breathing level of the entrants while in the confined space.
C. All air monitoring equipment shall have a visible and audible alarm with instantaneous readout.
D. Each Process shall maintain its own air monitoring equipment. Regular calibration and testing of the air monitoring equipment shall be in accordance with the manufacturer’s instructions and the Process written procedures.

151.8 When covers are removed from confined or enclosed spaces, a railing, temporary cover, or other approved temporary barrier shall guard the opening.

151.9 Safe and clear access to the confined space entrance shall be maintained at all times. If possible, all electrical cords, hoses, leads, ropes, etc., shall be routed through an entrance other than the employee’s access into the confined space.

151.10 A Safety Watcher shall be assigned when entering a Non-Permit or Alternative Entry confined space. See Section 152.

151.11 Retrieval Devices.
A. When entering a Permit Required Confined Space, unless their use may endanger the worker, the Authorized Entrant shall be equipped with an approved full body harness and lanyard/safety line or other approved retrieval apparatus.
B. The retrieval device shall be secured at the entrance and be accessible to the Entry Attendant without entering the space.

152 SAFETY WATCHER

152.1 The Employee-in-Charge shall assign a Safety Watcher whenever there are unusual work conditions, environmental hazards, limited visibility or communication, or any other situation that may create a serious safety hazard.

152.2 The Employee-in-Charge shall instruct the Safety Watcher about the hazards associated with the work site.

152.3 The Safety Watcher shall monitor the work site and maintain communication with assigned employees regarding changing hazards of the work site.

152.4 A Safety Watcher may perform other duties as long as the duties do not distract or interfere with monitoring the assigned employees.

152.5 Where the work is covered under MIOSHA Part 86, the Safety Watcher shall have First Aid and CPR training.
OPENING OF VAULT OR MANHOLE

154.1 Only approved manhole and vault cover hooks shall be used to remove or replace manhole, vault, or handhole covers.

154.2 The manhole or vault cover shall be placed away from vehicular traffic lanes and in a location so as not to present a hazard to workmen and the public.

154.3 Before an employee enters any manhole or vault the employee will refer to and comply with the Board of Water and Light Confined Space Inventory lists.

154.4 All employees shall inspect the manhole to determine the presence of potential hazards such as overheated or faulted cable, gas fumes, foul air, smoke, etc. If any hazard is found, the Employee-in-Charge shall be promptly informed and only with the Employee-in-Charge’s approval may an employee enter the underground area. If the presence of gas is detected, the area shall be purged and ventilated until further tests are made to determine that the manhole or vault is safe to enter.

154.5 Upon discovery of damaged cable, manhole, vault, etc., they shall be cleared of personnel until damaged cables are de-energized.

154.6 Employees shall not work in manholes where harmful toxic vapors or gases are present until sufficient ventilation has been provided to eliminate all such hazardous conditions, except when approved procedures are used.

154.7 Workers entering or leaving underground structures shall always use ladders.

WORKING AROUND UNDERGROUND UTILITIES

Warning: Additional rules may apply to working around energized lines, including approach distances, employee training and qualifications. Refer to Safety Manual Section 500 or MIOSHA Part 86.

155.1 Prior to any underground excavation or construction, contact shall be made with MISS DIG to locate and mark underground public utility services. The request shall define a specific construction location.

155.2 Miss Dig will not locate customer-owned utilities.

155.3 If the employee suspects that the locate marker(s) have been knocked down, removed or altered, the employee shall contact MISS DIG for restaking.

155.4 Prior to excavation, the employees shall survey the area to look for the presence of unmarked underground utilities.

155.5 Verification of Utility Location.
   A. Prior to excavation the excavator shall verify they are at the correct site.
   B. The exact location of the marked utilities shall be determined when they are located within 10 feet of the edge of the proposed excavation, unless using alternative, department specific, written procedures.

155.6 Hand Dig Zone.
   A. The Hand Dig Zone shall be established as the width of the utility plus 18 inches on either side of the outside edge of the underground utility.
   B. The exact location of all utilities within the Hand Dig Zone shall be located using hand digging, vacuum excavation, non-mechanized excavation tools, or any other nondestructive excavation practices.
   C. If unable to locate the utility within the Hand Dig Zone, MISS DIG shall be contacted for assistance.

155.7 All underground utilities shall be exposed across the entire width and depth of the proposed excavation.
155.8 All exposed utilities shall be supported to prevent falling or breaking. Contact the utility owner for specific requirements.

155.9 Buried Electrical Cable.
   A. All underground electric cable shall be considered energized.
   B. No pneumatic tools or metallic probes shall be used within three feet of underground facilities energized over 600 volts.

155.10 Damage to underground utilities, including nicks, dents, or scrapes to the utility coating.
   A. Immediately notify the Employee-in-Charge, who will immediately contact the utility owner.
   B. Immediately stop the work until further instructions have been received from the effected utility.
   C. Barricade the area to prevent unauthorized access to the site.

155.11 Damage to Gas Lines – See 116.9

155.12 When a miss-marked utility is discovered, even if there is no damage to the utility, the Employee-in-Charge shall notify the BWL Stake and Locate Supervisor who will contact the affected utility company.
SECTION 200
PERSONAL PROTECTIVE EQUIPMENT

200 Personal Protective Equipment General
201 Head Protection
202 Hair Protection
203 Eye Protection
204 Face Protection
205 Hearing Protection
206 Hand Protection
207 Foot Protection
208 Protective Clothing
209 Electric Arc Flash Protection
210 Respiratory Protection
211 Life Jackets
220 Fall Protection and Prevention

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200  GENERAL PERSONAL PROTECTIVE EQUIPMENT

200.1 Lansing Board of Water and Light shall maintain a written Personal Protective Equipment (PPE) Program. The written program shall provide guidelines for hazard assessment, equipment selection, and employee training.

200.2 PPE shall only be used after engineering controls or administrative controls are deemed not feasible or sufficient.

200.3 PPE Hazard Assessment.
   A. Each BWL process shall perform a hazard assessment to determine appropriate and necessary PPE for each job assignment or work site.
   B. The hazard assessment shall be verified with a written certification which identifies the worksite, person who certifies the assessment, and completion date.
   C. PPE must conform to currently accepted ANSI/ASTM standards.

200.4 PPE deemed necessary by the hazard assessment shall be provided to BWL employees.

200.5 Employees shall be trained in proper use and care of assigned PPE.
   A. Training shall be documented and certified by the employer.
   B. Employees shall demonstrate understanding of the training and ability to use assigned equipment.
   C. Employees shall be retrained if workplace changes or new PPE equipment renders previous training obsolete, or when there are inadequacies in employee usage of PPE.

200.6 PPE shall be selected to properly fit and not excessively interfere with the movements of the employee.

200.7 Shared PPE shall be adjustable, properly maintained and cleaned or sanitized between users.

200.8 Employees shall be responsible for proper use, care and maintenance of assigned PPE.

200.9 Damaged PPE shall be immediately repaired or replaced.

200.10 Safety Department shall approve all PPE prior to purchase or use in the workplace.

200.11 The daily Tailgate job briefing shall include a review of PPE appropriate to the job assignment.

201  HEAD PROTECTION

201.1 Hard hats shall be worn in all production, maintenance, construction, and equipment areas by all employees at all times.

201.2 Employees shall inspect hard hats prior to each use.
   A. Hard hats shall not be physically altered.
   B. Only manufacturer approved chin straps, face shields, ear muffs, emergency lights, or other accessories may be used.
   C. Hard hats shall remain free of all foreign material other than required stickers.
   D. Personal identification name tags made of non-conductive pressure sensitive tape may be attached on the shell of the hard hat (on the front above the bill).
   E. Hard hats shall never be worn with the suspension removed.

201.3 Hard hats shall be stored in a clean, dry place where they will not be exposed to physical damage, abuse, or excessive heat.
201.4 Hard hats may be removed when they constitute a hazard in a particular part of a work site only if there is no bump or overhead hazard or when operating equipment that is protected by a substantial roof or enclosed cab.
A. Specific locations where a hard hat is NOT required shall be specified in the PPE Hazard Assessment.
B. Hard hats shall be visible, within arm’s reach, and readily accessible to the employee at all times in these situations.

202 HAIR PROTECTION
202.1 Hair covering shall be used whenever the employees’ hair presents a danger of entanglement in moving or rotating machinery, tools, equipment, or potential for ignition.

203 EYE PROTECTION
203.1 A PPE hazard assessment shall be performed to determine the appropriate level of eye protection for the job assignment or work area.
203.2 The minimum level of eye protection is ANSI Z87.1-2003 compliant with non-conductive frames and permanently attached side shields.
203.3 Eye protection shall be worn in all production, maintenance, construction, and equipment areas by all employees at all times.
203.4 Prescription eyewear not qualified as safety glasses shall be covered by safety glasses or appropriate goggles for the job assignment.
203.5 Tinted or transitional lenses may be worn for outdoor work only. Only clear prescription or non-prescription safety glasses shall be worn for inside work assignments.
203.6 Contact lenses.
   A. Protective eyewear shall be worn over contact lenses.
   B. Contact lenses shall not be worn where there is an exposure hazard from chemical vapors, splashing liquids, dusting or any other condition where their use would increase eye damage.
203.7 Chemical, non-vented goggles shall be worn where there is a potential hazard from chemical vapors or splashing liquids such as when pressure washing, heating materials, inspecting batteries, transferring liquids, etc.
203.8 Impact (vented) goggles shall be worn when safety glasses with side shields may not provide adequate protection such as when chipping, drilling, grinding, power tools, compressed air, powder-actuated tools, etc.
203.9 Filter lenses, tinted shields or welding helmets with shade numbers appropriate for the work being performed shall be worn where there is an optical radiation hazard such as when gas-torch cutting, welding, using lasers, etc.

204 FACE PROTECTION
204.1 A PPE hazard assessment shall be performed to determine the appropriate level of face protection for the job assignment or work area.
204.2 Face shields shall be used as additional protection where work activities involve chipping, grinding, wire brushing, splashing liquids, or electric arc potential.
204.3 Safety glasses or goggles shall be worn under face shields.
205 HEARING PROTECTION
205.1 Lansing Board of Water and Light shall maintain a written Hearing Conservation Program.
   A. The written program shall provide guidelines for noise surveys and hazard assessments, audiometric testing, hearing protection devices, employee training, and documentation.
   B. Employees who are exposed to noise at or above 85dB shall participate in the hearing conservation program.

205.2 Employees included in the hearing conservation program shall:
   A. Participate in the annual audiometric testing.
   B. Wear appropriate hearing protection at work.
   C. Receive annual training.

205.3 Employees experiencing a recordable Standard Threshold Shift as determined by certified audiometric testing shall have a follow up session with the Safety Department consisting of a brief investigation, refresher training, and refit of the use of hearing protection devices.

205.4 A hazard assessment shall be performed to determine the appropriate level of hearing protection for the job assignment or work area.

205.5 Areas where the sound level exceeds 85 dB TWA, shall be identified with a warning sign “Hearing Protection Required”.

206 HAND PROTECTION
206.1 A PPE hazard assessment shall be performed to determine the appropriate level of hand protection for the job assignment or work area.

206.2 All gloves shall be inspected for holes, tears, ozone deterioration, texture changes, or any condition which would compromise the integrity of the glove.
   A. Any glove which fails to pass a visual inspection shall be returned to the Employee-in-Charge and discarded.
   B. Leather gloves which are contaminated with oils or other chemical materials shall be returned to the Employee-in-Charge for disposal.

206.3 Insulating Rubber Gloves.
   A. Insulating rubber gloves shall be used when working on or around electrical equipment that is energized or has the potential to become energized.

<table>
<thead>
<tr>
<th>Activity or Maximum Line Voltage</th>
<th>Required Insulating Rubber Glove Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removing or installing water and electric meters</td>
<td>Class 0</td>
</tr>
<tr>
<td>Removing or installing water meter ground connectors</td>
<td>Class 0</td>
</tr>
<tr>
<td>Installing or removing equipment ground connectors</td>
<td>Class 0</td>
</tr>
<tr>
<td>50 – 1,000 volts</td>
<td>Class 0</td>
</tr>
<tr>
<td>1,001 - 17,000 volts</td>
<td>Class 2</td>
</tr>
</tbody>
</table>

   B. Air check test.
      1. Employees shall perform a daily, or if damage is suspected, 20 second air check on insulating rubber gloves before use.
      2. Any insulating rubber glove which does not pass the air check test shall immediately be taken out of service and replaced.

   C. Electrical testing.
      1. All insulating rubber gloves shall be electrically tested before first issue.
2. All insulating rubber gloves in use shall be electrically tested every 30 days.

D. Protective covers.
   1. Leather protective covers shall be worn over all Class 2 insulating rubber gloves.
   2. Leather protective covers no longer suitable for protection of rubber insulating gloves shall be discarded.

E. Storage.
   1. Insulating rubber gloves shall be kept as free as possible from ozone, chemicals, heat, oils, and sunlight.
   2. Insulating rubber gloves shall not be folded, creased or compressed.
   3. Insulating rubber gloves shall be stored in a container or compartment that is designed and used exclusively for their storage.

206.4 Chemical Protective Gloves.
   A. Chemical protective gloves shall be worn whenever there is a potential for chemical exposure.
   B. Refer to the Safety Data Sheet for appropriate glove type.

207 FOOT PROTECTION
207.1 A PPE hazard assessment shall be performed to determine the appropriate level of foot protection for the job assignment or work area.
207.2 Minimum foot protection is a 6" high, sturdy work boot.
207.3 Leather athletic shoes are not considered appropriate foot protection.
207.4 Chemical protective boot covers shall be worn where there is a risk of chemical exposure.

208 CLOTHING
208.1 A PPE hazard assessment shall be performed to determine the appropriate protective clothing for the job assignment or work area.
208.2 Dangling sleeves or loose clothing shall not be worn when working on or near moving or rotating equipment.
208.3 Long sleeved shirts and long pants shall be worn when working on or near equipment that may be hot (boilers, steam lines, pumps, etc.).
208.4 High Visibility Clothing.
   A. High visibility vests (ANSI 107-2004, Class 2), shirts or jackets shall be worn when the work zone is within 15 feet of any public or private roadway.
   B. High visibility apparel shall be inspected prior to each use for wear, damage, fading, or other deterioration which effects visibility and reflectivity. Defective garments shall be immediately repaired or replaced.
   C. High visibility clothing shall be worn according to the manufacturer’s instructions to ensure the required level of visibility and reflectivity.
208.5 During welding and cutting work, fire retardant (FR) or leather clothing shall be worn. The specific protection depends upon the job hazard, but clothing shall be free of excessive oil or grease.

209 ELECTRIC ARC FLASH PROTECTION
209.1 Lansing Board of Water and Light shall maintain a written Arc Flash and Shock Hazard Safety Program. The written program shall provide guidelines for hazard assessment, PPE selection, and employee training.
209.2  A PPE hazard assessment shall be performed to determine work assignments that require Arc-Rated (AR) clothing and other appropriate arc-rated PPE.

209.3  Only natural fiber clothing shall be worn when exposed or there is a potential for exposure to electric arc or flames.

209.4  Synthetic fabrics shall not be worn, either alone or in blends, unless it can be demonstrated that they have been treated to withstand the conditions that may be encountered.

209.5  Where required, the minimum AR clothing requirement is AR pants and AR long sleeve shirt.

209.6  Additional clothing worn over or under the AR clothing shall be made of all natural fibers.

209.7  When work is performed on energized parts or equipment, employees shall remove all conductive articles such as keys, watch or wallet chains, rings, ear rings, necklaces, wrist watches, wrist bands, and eye glasses with metal frames or clothing with metallic attachments.

210  RESPIRATORY PROTECTION

210.1  Lansing Board of Water and Light shall maintain a written Respiratory Protection Program. The written program shall provide guidelines for hazard assessment, respirator selection, fit testing, and employee training.

210.2  A hazard assessment shall be performed to determine the appropriate level of respiratory protection for the job assignment.

210.3  Employees shall be medically qualified prior to respiratory protection fit testing and use.

210.4  Employees shall be fit tested on all assigned respiratory protection prior to initial use, with annual retesting.

210.5  Employees shall be trained in the use of each type of assigned respiratory protection on initial assignment with annual refresher.

210.6  Employees are responsible for respirator maintenance. Defective equipment shall be immediately returned to the Employee-in-Charge for replacement.

211  LIFE JACKETS

211.1  A U.S. Coast Guard Class I or II approved life jacket shall be worn when working in, over, or adjacent to a river, pond or similar water body.

220  FALL PROTECTION AND PREVENTION

220.1  Administrative.

   A.  The BWL shall maintain a written fall protection and prevention program intended for the protection of BWL employees, contractors, vendors, visitors and the public in BWL facilities and at BWL job sites.

   B.  The BWL Fall Protection and Prevention Program shall be maintained in full compliance with MIOSHA Construction Safety Standard Part 45: Fall Protection, and other applicable MIOSHA Safety Standards.

   C.  The BWL Fall Protection and Prevention Program shall be periodically audited by the BWL Safety Committee for adherence to regulatory statutes and general applicability.

   D.  Employees who may be exposed to fall hazards shall be trained in the provisions of the BWL Fall Protection and Prevention Program.

   E.  Each BWL department shall perform a fall hazard assessment of work areas and work tasks to determine if recognizable fall hazards may exist.
220.2 General.
A. No BWL employee, contractor, vendor, visitor, or member of the public shall be exposed to (or to the possibility of) a fall of six feet or greater from any unprotected edge of a platform, walking or work surface, or edge of an excavation in a BWL facility or jobsite, without appropriate protection from the fall.
B. Whenever possible, permanent barricades or guardrailing systems or temporary barriers or guardrailing systems shall be erected for the particular work task.
C. When a portion of a permanent guardrailing system is removed for a work task, temporary barriers or guardrails and warning signs shall be erected around the work area to prevent access by unauthorized persons.
D. Where guardrailing systems are not practical, or must be removed for access to perform the work task, a fall protection system shall be used to protect employees from falls.
E. Every fall by a person using fall protection equipment (FPE) shall be reported and investigated as an injury.
F. Any person subjected to a fall shall be examined and cleared by a physician prior to returning to work.
G. Each piece of a fall protection system (body harness, lanyard, self-retracting device, and any portable and reusable attachment device) subjected to an employee fall shall be removed from service and rendered inoperable.

220.3 Equipment Selection and Inspection.
A. The BWL shall purchase and provide the required FPE to employees and replace worn or damaged equipment as necessary.
B. Departments needing to provide FPE shall determine their individual needs and select appropriate equipment with assistance from the BWL Safety Department.
C. Departments shall provide annual inspections and documentation of FPE issued to employees.
D. Any FPE which fails inspection shall be rendered inoperable and be discarded in order to prevent its reuse.

220.4 Equipment Use and Care.
A. A fall arrest system shall consist of rated anchorage point(s), full body harness, and connecting device (e.g., shock absorbing lanyard, self-retracting device, connectors, and lifelines if applicable).
B. Body belts shall not be used as a component of a fall arrest system.
C. Rip-stitch and similar style tear-apart shock-absorbing lanyards shall not be used when the possible fall distance is less than 18 feet (from anchorage point to the next lower level).
D. Only BWL-approved and supplied FPE shall be used by BWL employees.
E. Employees shall properly adjust, wear, use, and store their assigned FPE.
F. Employees shall inspect their equipment immediately prior to each use, and return any damaged or suspect equipment to the Employee-in-Charge for replacement.
G. Fall protection body harnesses, lanyards, and other personal FPE shall be protected from exposure to and damage from excessive dirt, oils, paints, solvents and other chemicals, and open flames, sparks, weld or cutting debris, and weld flash radiation during use.
H. Fall protection body harnesses, lanyards, and other personal FPE shall be stored to be protected from water, snow, ice, excessive dirt, oils, paints, solvents and other chemicals, and prolonged exposure to sunlight.
I. No component or part of a personal fall arrest system shall ever be used to rig, hoist, or lower any materials.
J. Shared or common FPE devices such as a portable and reusable attachment devices, adjustable structural steel anchorages, lifelines, etc. shall be stored in identified cabinets, either in BWL trucks or in BWL facilities.
K. Whenever working in an elevated position in a facility, employees shall attach their fall protection lanyard, self-retracting device, portable and reusable attachment device, or lifeline to a rigid part of the structure overhead to minimize possible fall distance.
L. A lanyard, self-retracting device, portable and reusable attachment device, or lifeline shall never be attached to or allowed to contact any energized installation, such as an overhead conductor, switch, conduit, cable tray, bus enclosure, or a support for such an energized item.
M. Personal fall arrest systems shall never be attached to a standard guardrail/handrail system.
N. Employees working in an aerial lift device or a mobile elevated work platform shall wear a full body harness with shock absorbing lanyard or self-retracting device, or a body positioning belt properly attached to the designated attachment anchorage(s) of the aerial lift or work platform.
O. Employees constructing or dismantling scaffolding shall be protected from falls of 10 feet or greater by a fall protection system.
P. Any employee working from a scaffold at a height of six feet or more from the supporting surface of the scaffold shall be protected from a fall either by a proper guardrail system, or by another fall protection system.
Q. Employees working on or from suspended scaffolds shall be protected from falls by a fall protection system using an independently secured lifeline.

220.5 Fall Protection Training.
A. The BWL shall provide fall protection and prevention training to BWL employees that may be exposed to fall protection hazards.
B. Training shall be provided by designated employees who have been deemed competent to:
   1. Recognize fall hazards.
   2. Identify when FPE is necessary.
   3. Determine what FPE is required.
   4. Inspect the equipment prior to use.
   5. Properly put on (DON), take off (DOFF), adjust and wear the FPE.
   6. Understand the limitations of the FPE.
   7. Know or determine the proper care, maintenance, and useful life of the FPE.
   8. Erect, maintain, disassemble, and inspect temporary fall protection systems.
   9. Develop a fall protection work plan for the particular work task.
  10. Develop a rescue plan for the particular work task.
C. Each BWL department shall determine their individual fall protection training needs and content based on their own fall protection hazard assessments.
D. New employees, including transfers, shall be trained before they are required to perform a work task requiring FPE.
E. Employees receiving fall protection and prevention training shall be responsible to attend the training sessions, and be responsible for understanding the content of the training provided.
F. Refresher training shall be provided when the following situations are encountered:
   1. Previously trained employees are not demonstrating the proper understanding and skill level required by Rule 220.5A.
   2. Changes in the workplace.
   3. The issuance of new or changes in the type of fall protection systems or equipment to be used that may render prior training obsolete.
   4. Any changes in the regulations affecting fall protection.
   5. Any changes within the BWL’s Fall Protection and Prevention Program.
G. Fall protection and prevention training shall be in accordance with the provisions of the BWL written program for Develop, Deliver and Documentation of Training.

220.6 Fall Protection Plan.
A. For each work task that requires the use of FPE, a fall protection plan shall be developed prior to the start of the work and communicated during tailgate to the affected employees.
B. A fall protection plan shall provide a review of the work which requires the use of fall protection equipment, a review of the known fall hazards, a review to determine if barriers can be used, and a review of the fall protection equipment to be used, an inspection of each piece of FPE to be used, and the fall protection rescue plan to be followed in the event of an employee fall.
C. All employees involved in the work task shall be present for the fall protection plan review. If an employee joins the work task late, the work shall stop until a second review of the fall protection plan can be conducted.
D. Fall protection plans shall be recorded and maintained by each individual department for training and program auditing.

220.7 Fall Protection Rescue Plan.
A. A fall protection rescue plan shall be developed for each work task that requires the use of FPE. The purpose of the fall protection rescue plan is to provide for the prompt rescue of any employee, contractor, vendor or visitor who is subjected to an arrested fall in a BWL facility, or on a BWL jobsite.
B. The fall protection rescue plan shall include a review of the equipment and personnel to be used to rescue a person who is subjected to an arrested fall.
C. Each fall protection rescue plan shall consider the particular work area, the elevation of the work, the estimated distance of a fall, and any restrictions of, or hazards to, emergency response to the work area.
D. The equipment identified for use in the fall protection rescue plan shall be available at or near the site of the work to minimize the rescue response time.
E. The fall protection rescue plan shall outline the responsibility of each employee of the work crew in the event of an employee fall.
Special activities such as utility pole climbing and tree trimming are addressed in BWL Safety Manual Sections 500 and 1200 respectively.
SECTION 300
VEHICLE OPERATIONS

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300 GENERAL VEHICLE OPERATIONS

300.1 Only full-time BWL employees or persons specifically authorized by the General Manager or the General Manager’s designee who possess a valid license or permit for the equipment being used shall operate BWL motor vehicles on BWL business.

A. Drivers shall know and obey all state and local motor vehicle laws applicable to the operation of their vehicle.

300.2 The Employee-in-Charge shall prohibit unauthorized persons to drive or operate vehicles.

300.3 All vehicle loading and operation shall be done according to applicable state and federal Department of Transportation rules and regulations.

A. All load and lifting limits shall be posted on equipment.

300.4 The driver shall drive at safe speeds no greater than that permitted by law. Traffic, road, and weather conditions shall be given consideration in determining the safe speed within the legal limit at which the vehicle shall be operated.

300.5 The operator of a motor vehicle shall clearly signal intention of turning, passing, and stopping.

300.6 Drivers shall be prepared to stop and yield the right-of-way in all instances when necessary to avoid an accident.

300.7 The driver of a vehicle shall be courteous toward other operators and pedestrians. The vehicles shall be operated in a safe manner, and the driver shall yield the right-of-way to pedestrians and other vehicles when failure to do so might endanger any person or another vehicle.

300.8 The driver shall maintain sufficient distance behind another vehicle to safely stop the vehicle.

300.9 Drivers shall exercise added caution when driving through residential and school zones.

300.10 When entering or leaving any building, enclosure, alley, or street where vision is obstructed, a complete stop shall be made and the driver shall proceed with caution.

300.11 Trucks on which derricks or booms are raised above traveling height shall not be moved except under the immediate direction of the Employee-in-Charge who shall give his undivided attention to the movement.

300.12 Before a vehicle is driven under and adjacent to energized equipment, especially in substation areas, the clearance shall be checked, especially that of the radio antenna, to ensure that proper clearances will be maintained between the vehicle and energized equipment.

300.13 When proceeding down a grade, the clutch shall not be disengaged. Trucks, particularly if heavily loaded, shall be in a lower gear on steep grades.

300.14 If a vehicle or piece of equipment does not start for any reason, contact Fleet Services for assistance. Only qualified, trained employees shall jump start BWL vehicles or equipment.

300.15 All items in the truck cab or on the bed shall be secured for unanticipated shifting or movement due to turns, fast stops, acceleration, etc.

300.16 Keep truck bins free of dirt and unnecessary objects.

300.17 Keep truck cabs clean and free of unnecessary items.

301 SEAT BELTS AND SHOULDER HARNESSSES
301.1 Safety seat belts and shoulder harnesses shall be worn by both drivers and passengers.

301.2 Personal Vehicles - Employees who drive their personal vehicles for BWL business shall also wear safety seat belts and shoulder harnesses.

302 VEHICLE ACCIDENTS

302.1 If any person is injured as the result of a vehicle accident, employees shall see that necessary emergency aid is provided. Ambulance transportation and emergency treatment shall be arranged by contacting the Employee-in-Charge, BWL Security at 7077, BESOC at 6433, or calling 911 (4911 from BWL phone lines).

302.2 Human Resources shall be notified immediately of any vehicle accidents that result in any injury.
   A. Even in the presumed absence of injury, medical consultation for both vehicle operator and passengers will be mandatory if airbags deployed.

302.3 All motor vehicle accidents shall be reported to the appropriate police agency and the Employee-in-Charge as soon as possible after the accident.
   A. The vehicle operator must:
      1. Secure the names and addresses of witnesses and others involved in accident.
      2. Note the position of the vehicle after the collision.
      3. Complete the BWL Vehicle and Equipment Accident Report form, and
      4. Submit the original completed report to the Employee-in-Charge.
   B. The Employee-in-Charge shall:
      1. Ensure employee’s fitness for returning to the job, and
      2. Send copies of the completed BWL Vehicle and Equipment Accident Report form to:
         a. Fleet Services
         b. Safety
         c. Risk Management

302.4 Employees shall neither sign statement nor discuss nor argue the causes or results of an accident with anyone but law enforcement or proper representative of the BWL.

302.5 Should another involved party demand immediate action, referral shall be made to the Employee-in-Charge.

303 INSPECTIONS OF VEHICLE AND EQUIPMENT

303.1 Before operating a BWL vehicle or equipment, each driver or operator shall make sure that the vehicle or equipment is in proper operating condition.
   A. Refer to the BWL’s Driver’s Responsibility decal posted in the vehicle.
   B. Any unsafe condition should be reported to the Employee-in-Charge and Fleet Services for correction.
   C. Vehicles with steering and brake defects shall not be driven.
   D. The driver shall inspect windshield wipers frequently and see that they are in good operating condition and that the windows and windshield give sufficient visibility for safe operation of the vehicle.
   E. Snow and ice shall be removed from vehicle prior to operation.
   F. All vehicle lights and reflectors shall be inspected daily by the employee; and if found defective, they shall be repaired immediately.

303.2 An inspection, check list, instruction, and any form provided for a vehicle shall not be removed or defaced unless directed by the Employee-in-Charge.
303.3 Only qualified employees may adjust safety devices (i.e. sensing or limiting devices, etc.).
303.4 The driver shall report any defects that may have developed during the day. Items that affect safety shall be repaired prior to continued vehicle operation.

**304 TRANSPORTING EMPLOYEES**

304.1 Employees being transported for BWL purposes shall ride only in truck cab or crew compartment.
304.2 Only authorized personnel shall be passengers in BWL vehicles.
304.3 Employees shall refrain from standing in front of or in back of the vehicle when it is being started.
304.4 Employees shall refrain from getting on or off the truck, vehicle, or equipment while it is in motion.

**305 TRANSPORTING MATERIALS**

305.1 All tools and materials shall be safely stored in the proper compartment while driving to and from the job site. Always make sure materials are secured to prevent them from shifting or falling.
305.2 Refer to Section 521 for pole-handling requirements.

**306 PARKING**

306.1 Vehicles and equipment shall never be left unattended with the motor running.
   A. Ignition system shall be turned off.
   B. The ignition system shall not be left running while vehicle is parked in a garage.
   C. A vehicle shall not be warmed up inside a garage nor shall the driver test the engine operation in a garage unless the exhaust gas is carried directly to outside atmosphere by a local exhaust ventilation system or doors and windows are open so adequate natural ventilation exists.
   D. An exception shall be permitted for a vehicle engine left temporarily running when the vehicle is:
      1. Operating in extreme cold.
      2. Parked with the parking brake engaged and taillights/emergency flashers on.
      3. Under the continuous monitoring of the driver.
      4. Parked outside a garage or other similarly walled space.
      5. Needed to operate emergency equipment, warning lights, or radios.

306.2 When vehicles or equipment must be parked on the roadway or within ten feet of a traveled road, they shall:
   A. Be parked on the right-hand side facing in the direction of traffic flow, whenever possible.
   B. Be parked off the traveled road surface, whenever possible.
   C. Be protected with proper warning lights, reflectors, or red flags in accordance with state or local requirements.

306.3 Vehicles shall not be parked on bridges or over culverts except when necessary for work.

306.4 Vehicles and equipment needing to be parked on an incline shall be left in a safe position, with:
   A. Ignition system turned off.
   B. Parking brake engaged and taillights/emergency flashers on.
C. The continuous monitoring of the driver.
D. Rear wheels chocked.

306.5 Use wheel chocks or blocking on all trailers and other towed equipment not equipped with parking brakes when not attached to a towing vehicle.

306.6 Stopping and/or parking on the highway shall be avoided.
A. Warning signals and lights shall be used.
B. Rotating beacon shall be used.
C. Tail lights/emergency flashers shall be used.
D. Flares or reflectors shall be placed to give adequate advance warning.
E. If work is in progress, traffic control devices shall be used in accordance with the Michigan Manual on Uniform Traffic Control Devices.

307 BACKING
307.1 Whenever possible, the vehicle shall be positioned to avoid the necessity of backing.
307.2 Another employee, if present, shall be stationed at the rear of the vehicle to assist the driver in backing the vehicle safely.
307.3 When backing a vehicle, take the following precautions:
A. A reverse signal (back-up alarm) and back-up cameras shall be used if vehicle is so equipped.
B. Back slowly.
C. Watch both sides but do not depend entirely on mirrors.

309 EQUIPMENT FUELING
309.1 When refueling vehicles, employees shall follow all posted rules and regulations indicated on the pump.
309.2 No form of ignition shall be allowed in the immediate area while handling any type of combustible fuel. The operator must remain in the immediate (within 10 feet) area while dispensing fuel.
309.3 Firefighting equipment shall be present during fueling.
309.4 Engine and lights shall be turned off prior to fueling.
309.5 To prevent a static spark:
A. Contact the nozzle, spout or metal part of the can with the equipment before removing cap from the fuel tank.
B. Keep the pouring spout in contact with the tank while pouring.
C. Fuel storage containers shall be on the ground when filling.
309.6 Store flammable liquid fuels, such as gasoline and cleaning solvent, only in approved safety containers.
309.7 Move mobile equipment outdoors before fueling.
309.8 If fuel is spilled on equipment, be sure that spilled fuel is completely cleaned up, evaporated or free from ignition before starting equipment.

310 POWERED INDUSTRIAL TRUCKS
310.1 Only employees who are trained, possess a valid Operator’s Permit/Certification, and are authorized shall operate a powered industrial truck. Refer to BWL Powered Industrial Truck Training Program.
A. The Operator’s Permit/Certification shall be readily available upon request.
B. Retraining is required every three years to renew the Permit/Certification.
C. Refresher training is required when there is an accident, near-miss, or unsafe operation, new or different equipment is introduced or the work place conditions change.
310.2 Before using the equipment the operator shall inspect the condition of the equipment. This shall be done at least once per shift.
   A. All equipment defects shall be immediately reported to the Employee-in-Charge, and the truck shall be taken out of service.
   B. Equipment tagged out of service shall only be operated once Fleet Services has deemed it safe to operate.

310.3 All powered industrial trucks shall have a clearly visible, legible name plate with maximum load capacity and lift height.

310.4 Before operating the equipment, the operator shall make sure that no person or objects are in the path of the vehicle.
   A. Clearance distance in all directions, including overhead, shall be checked to ensure sufficient safe operating distances.
   B. Safe working distances for electrical equipment shall be complied with. See Section 501 SAFE WORKING DISTANCES.

310.5 Battery Charging. See also Section 309 EQUIPMENT FUELING.
   A. Vehicles shall not be charged with the engine running.
   B. No ignition sources shall be allowed in the immediate area of vehicle charging.

310.6 Only attachments provided by or approved by the manufacturer or qualified engineer shall be use.

310.7 Modifications and Maintenance.
   A. Modification to powered industrial trucks shall only be made with the authorization and certification of the manufacturer or qualified engineer.
   B. Only trained and authorized employees shall perform maintenance and servicing of powered industrial trucks.

310.8 Overhead protective guards shall not be removed.

310.9 Passengers are not allowed.

310.10 Only powered industrial trucks specifically designed to elevate personnel shall be used to do so.

310.11 Seatbelts, when provided by the manufacturer, shall be used when operating a powered industrial truck.

310.12 Stunt driving and horseplay are prohibited.

310.13 Loading.
   A. The rated load of the machine or the forks shall not be exceeded.
   B. Loads shall be positioned as far back as possible and secured.
   C. When picking up a load, forks shall be set squarely and as far as possible under the load.
   D. Loads shall not be raised or lowered while traveling.
   E. Loaded or empty, forks shall be carried as low as possible, but high enough to clear uneven surfaces.
   F. Loads shall be securely fastened or safely positioned to prevent tipping or falling.

310.14 Driving.
   A. Vehicles shall always be operated at a safe speed for existing conditions.
   B. The operator shall face or look in the direction the forklift is traveling.
   C. Always sound horn when approaching doors, blind corners, and intersections and proceed with caution.
   D. A safety watcher is recommended any time operator’s view is obstructed.
   E. Inclines.
      1. If empty – drive in reverse up the incline, drive forward down the incline.
2. If loaded – drive forward up the incline; drive in reverse down the incline.

310.15 Vehicles shall be parked where they do not block exits or emergency response equipment.

310.16 Loading Docks and Trailers.
A. Dockboards shall be used when loading or unloading trucks.
B. The wheel of the truck shall be blocked/chocked and a visual safety inspection of the dock plate and flooring of the vehicle shall be made.
C. Maintain a safe distance when operating fork truck near the edge of a loading dock.

311 HEAVY AND SPECIALIZED EQUIPMENT
311.1 Only qualified employees shall operate motorized equipment.
311.2 The manufacturer’s procedures regarding operation, maintenance, adjustments, and repairs shall be followed by qualified employees.
311.3 Before starting any equipment, the operator is responsible for the inspection and testing of controls, brakes, hydraulic lines, connections, cables, etc.
311.4 Before operating, be sure everyone is clear of the machine, paying special attention to swing radius.
311.5 When working around load-alls, backhoes, excavators, leaders, etc., stand clear of pinch points.
311.6 Only authorized employees (no riders) shall be permitted on equipment.
311.7 Outriggers shall be operated, placed and inspected according to manufacture procedure.
311.8 Equipment shall never be left unattended with the motor running.
   A. Ignition system shall be turned off.
   B. The ignition system shall not be left running while vehicle is parked in a garage.
   C. A vehicle shall not be warmed up inside a garage nor shall the driver test the engine operation in a garage unless the exhaust gas is carried directly to outside atmosphere by a local exhaust ventilation system or doors and windows are open so adequate natural ventilation exists.
   D. An exception shall be permitted for a vehicle engine left temporarily running when the vehicle is:
      1. Operating in extreme cold.
      2. Parked with the parking brake engaged and taillights/emergency flashers on.
      3. Under the continuous monitoring of the driver.
      4. Parked outside a garage or other similarly walled space.
311.9 After parking equipment:
   A. The blade, scoop, etc. shall be secured by resting at ground level.
   B. Parking brake shall be engaged.
   C. Vehicle wheels shall be chocked if parked on an incline.
311.10 Before any maintenance or repair work begins, approved safeguard procedure shall be taken for any power-driven equipment.

312 POWER-DRIVEN WINCH
312.1 The employee directing the overall operation shall be in a position where this employee can be clearly seen and understood while giving instructions.
312.2 Always check position of winch line in block, and security of chains and other slings before applying load or moving truck. Do not overload at any time.
312.3 Leather gloves shall always be worn when handling winch lines.
312.4 Before placing any winch line under strain:
   A. Winch operator shall give verbal warning.
   B. All workers shall stand clear.
312.5 Winch equipment shall be inspected before each use; if repairs are needed, they shall be done promptly and before additional use.
312.6 Only approved chains, slings and winch lines shall be used.
312.7 Energized wires or equipment shall always be avoided.
312.8 No employee shall be under a suspended load or inside the angle of a winch line. No employee shall stand or work near a cable, chain, or rope under tension unless the nature of the work requires it.
312.9 Winch lines, ropes or wire cables shall not be guided by hand when standing within reach of drum or sheave.

313 CRANE, HOIST, DERRICK
313.1 Only authorized persons shall be permitted in the cab or on the equipment. Only trained and qualified employees shall operate the hoisting equipment.
313.2 Before using the equipment the operator shall inspect the condition of the equipment. This shall be done at least once per shift.
   A. All equipment defects shall be immediately reported to the Employee-in-Charge, and the truck shall be taken out of service.
   B. Equipment tagged out of service shall only be operated once Fleet Services has deemed it safe to operate.
313.3 Signals to the equipment operator shall be given by one person designated to perform this task and must be maintained throughout the operation. Refer to table below for standard signals.
   A. If communication becomes interrupted, operations must stop until communication is reestablished.
   B. Signal person shall be properly qualified.
   C. A “stop” signal given by anyone must be obeyed by operator.
A. Always stand clear of moving loads.
B. Never ride on load or hooks.
C. Never stand or walk under suspended or moving loads, nor cable and hook.

313.5 Load limits, as specified by the manufacturer:
A. Shall not be exceeded under any circumstance.
B. Shall be posted and never removed from the equipment.

313.6 Before a lift is attempted, the:
A. Lifting mechanism shall be level and firmly supported, with hoist line centered over the center of gravity of the load to be lifted.
B. Weight of the load shall be determined.
C. Load shall be test-lifted and the brakes checked.
D. Slings and bindings shall be checked and readjusted as necessary for stability.

313.7 When mobile hoists, cranes or similar lifting devices must be used near energized lines or equipment, the lifting device shall be:
A. Properly grounded, or
B. Insulated, or
C. Isolated.
D. With clearance:
   1. In accordance with electrical section for transmission and distribution construction, or
   2. When work does not involve power transmission or distribution and maintenance, minimum clearance distances shall be the following (numbers are expressed as phase to ground):
      a. Up to 50kV – 10 feet, phase to ground.
      b. Over 50kV to 200kV – 15 feet, phase to ground.

313.9 Operators shall not leave their position at the controls of the cranes, hoists, derricks or other lifting devices while the load is suspended.

314 RIGGING EQUIPMENT

314.1 All rigging equipment shall be sufficient strength, proper type, and safe for its intended use.

314.2 Rigging equipment shall not be loaded beyond its rated capacity.
A. Load weights shall be determined before attempting to lift them.
B. Loads shall not exceed manufacturer specifications.

314.3 Operating and maintenance procedures as specified by the manufacturer shall be followed.

314.4 Only trained qualified employees shall operate hoisting equipment.

314.5 Keep suspended loads clear of all obstruction.

314.6 When working with hoisting equipment under tension, employees shall position themselves to minimize the potential of being struck by a cable or other rigging equipment, in case of failure.

314.7 Do not place hands or fingers between the sling and its load while the sling is being tightened around the load.

314.8 Shock loading such as pinching off of dropping load on a slack sling is prohibited.

314.9 Allowances shall be made for unknown factors when determining the adequacy of the equipment being used.

314.10 Before use:
A. Slings, fastenings and attachments shall be inspected by a qualified person and removed from service if damaged or defective.
B. Ensure slings have proper rating tags attached.

314.11 Makeshift lifting devices formed from bolts, rods or reinforcing steel shall not be used.
314.12 Slings shall not be shortened with knots, bolts, or other makeshift devices.
314.13 Slings shall be padded or protected from the sharp edges of their loads.
314.14 When eyebolts are used, care shall be taken to ensure the bolt is not side loaded.
314.15 A sling shall not be pulled from under a load when the load is resting on the sling.
314.16 Slings shall be long enough to provide the maximum particle angle between the sling leg and the horizontal plane of the load.
314.17 Slings shall be securely attached to the load using hooks with retaining devices or the use of shackles or other positive latching device.
   A. Shackle pins shall never be replaced with bolts or other non-approved devices.
   B. Only hooks with approved retaining devices shall be used.
   C. Hooks shall never be rigged so that they are point loaded at the tip of the hook.
   D. The load shall be securely seated in the shackle of the hook.

315 AERIAL DEVICES
315.1 Only authorized persons who are properly trained and qualified shall use or operate aerial devices.
   A. Only qualified employees shall approach or work at energized conductors.
   B. All other employees and equipment operators shall maintain a safe clearance from electrical installations.
315.2 When positioning an aerial lift device, ensure:
   A. Appropriate traffic control.
   B. Public safety.
315.3 Tools shall be inspected before taking aloft.
315.4 The operating and maintenance instruction manuals issued by the manufacturer shall be on the vehicle and followed.
   A. Aerial devices shall not be “field modified”.
   B. The insulated portion shall not be altered in any manner.
315.5 Prior to use, the aerial device:
   A. Shall be given a warm-up period.
   B. The hydraulic system and the lift controls shall be checked and tested.
   C. Malfunctions or unsafe operational conditions shall be reported and device removed from service.
315.6 Aerial devices shall have both upper and lower controls. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.
315.7 When moving a vehicle supporting an aerial device:
   A. The boom shall be lowered, the basket cradled and secured.
   B. The outriggers shall be fully retracted.
   C. Employees may remain in the bucket for short moves, and must be facing the direction of travel.
315.8 When employees are in the bucket of an aerial lift, the emergency brake of the vehicle shall be used to provide added protection. When the vehicle is on
an incline, wheel chocks shall be used regardless of whether outriggers are used. The truck should sit approximately level when viewed from the rear.

315.9 When outriggers are used, they shall be set on approved pads. Outriggers shall not be extended or retracted outside of clear view of the operator unless all employees are outside the range of possible equipment motion.

315.10 Safety rules governing the use of hot-line tools, rubber goods, personal protective equipment, and general safe practices shall also apply to work done from aerial baskets.

315.11 The operator shall always face in the direction in which the basket is moving and shall see that the path of the boom or basket is clear when it is being moved.

315.12 Employees’ feet shall be on the floor of the basket the entire time they are in it. Employees shall not work from the top or edge of the basket or on ladders placed in the basket.

315.13 Employees shall not wear climbers while in the basket.

315.14 When two employees are in the basket or baskets:
A. One of them shall be designated to operate the controls.
B. One employee shall give all signals, which shall be thoroughly understood by all persons concerned.
C. When two employees are working from the basket, employees shall not contact poles, crossarms, or other grounded or live equipment while the second employee is working on equipment at a different potential.

315.15 The aerial lift, together with the employee in the basket and all tools and equipment, shall maintain proper safe working distance (Refer to Safety Manual rule 501).
A. When necessary, a safety watcher shall be used to ensure safe working distance is maintained.
B. When required, appropriate protection shall be requested and provided by the Electric Transmission and Distribution Department.

315.16 When using tools in a basket, the operator shall ensure that hoses, handlines, droplines, etc. do not become entangled in the operational controls.
A. Electric drills with cords are restricted to areas at 600 volts or less.

315.17 Aerial basket vehicles working adjacent to energized primary shall be properly grounded or barricaded and treated as energized.
A. An exception shall be permitted for a vehicle equipped with lower boom and pedestal insulation rated for the working voltage.

315.18 Aerial Lift Operators shall wear a full body harness with approved connecting device attached to the designated attachment point on the aerial lift.
A. Employees shall not attach belt to an adjacent pole or structure.

315.19 Approved escape devices, rescue blocks and boom straps shall be in their designated places before going aloft.

315.20 Work shall not be performed from the cab guard of aerial lift device.

315.21 The insulated boom shall be kept clean and inspected daily, and dielectrically tested annually.

316 AERIAL WORK PLATFORMS

316.1 A full body harness with attached approved connecting device shall be used by each employee at all times when working in aerial work platforms, with attachments to the designated attachment point on the aerial work platforms.

351 BARRICADING AND TRAFFIC CONTROL
351.1 GENERAL
A. Work area protection is the adequate safeguarding or protecting of pedestrians, motorists, utility workers and equipment using:
   1. Barriers
   2. Warning signs
   3. Lights
   4. Flags
   5. Traffic cones
   6. High level standards
   7. Barricade rope
   8. Traffic regulators (flaggers), etc.
B. The public must be warned in advance, then regulated and guided safely through or around the work area; and planned to ensure protection of the public, the workers and the equipment.
C. Refer to Part VI of the current Michigan Manual of Uniform Traffic Control Devices (MMUTCD) for specific direction on the use of safeguards listed in 351.1A.

351.2 Whenever possible, trucks or equipment shall be placed between the working area and oncoming traffic to serve as a barricade.

351.3 If the work area in the street is expected to take less than 15 minutes, cones may be omitted when using high-intensity rotating, flashing, oscillating or strobe lights.

351.4 To protect pedestrians from unattended excavation, warning signs and/or tape and barricades shall be placed around the work area.

351.5 See rule 208.4A regarding high-visibility clothing.

351.6 Near schools and heavy pedestrian areas, a person shall be posted to direct pedestrian traffic around the work zone.

351.7 The appropriate street and law enforcement agencies shall be contacted for permission and assistance if it is necessary to provide protection to the public beyond normal signing or barricades.

351.8 All traffic control devices shall be removed immediately when no longer needed.

353 TRAFFIC REGULATORS (FLAGGERS)
353.1 Traffic regulators and appropriate traffic controls shall be used whenever there is any doubt that effective protection cannot be provided by signs, signals, and barricades.

353.2 Traffic regulators shall:
   A. Read, understand, and follow the D.O.T. Traffic Regulators Instruction Manual to ensure signals provide sufficient warning to protect themselves and the work site.
   B. Don the appropriate personal protective equipment.
   C. Employ adequate equipment and signage in good working condition.
   D. Conduct themselves in a manner consistent with the Manual.

355 ATTENTIVE DRIVING
355.1 Employees driving for BWL business – cars, trucks, powered industrial trucks, aerial lifts, boom trucks, lawn equipment, backhoes, etc. – shall maintain continuous attention to vehicle operation.

355.2 Cell phones and other electronic devices shall not be used by the vehicle operator/driver while the motor vehicle is in motion.
A. Ensure mobile devices are secured.

355.3 Use of cell phones or other electronic devices may be conducted while the motor vehicle is parked in a safe location.

355.4 Cell phones and other electronic devices shall not be used by any BWL employee while driving a personal vehicle for company business.
## SECTION 400  
TOOLS AND EQUIPMENT

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400  GENERAL TOOLS AND EQUIPMENT
400.1 All tools, regardless of ownership shall be of an approved type and maintained in good condition. (Tools are subject to inspection at any time. The Employee-in-Charge has the authority and responsibility to condemn unserviceable tools regardless of ownership).
400.2 Defective tools shall be tagged to prevent their use, or they shall be removed from the job site. Employees shall always use the proper tool for the job performed. Makeshift and substitute tools shall only be used with proper authorization and under supervision.
400.3 Hammers with metal handles, screwdrivers or knives with metal continuing through the handle, and metallic measuring tapes shall not be used on or near energized electrical circuits or equipment.
400.4 Tools shall not be thrown from place to place or from person to person; tools that must be raised or lowered one elevation to another shall be placed in tool buckets or firmly attached to hand lines. Tools shall never be placed unsecured on elevated places.
400.5 As impact tools such as chisels, punches, drift pins, etc. become mushroomed or cracked, they shall be dressed, repaired or replaced before further use. Chisels, drills, punches, ground rods and pipes shall be held with suitable holders or tongs (not with the hands) while being struck by another employee.
400.6 Shims shall not be used to make a wrench fit.
400.7 Wrenches with sprung or damaged jaws shall not be used.
400.8 Pipe shall not be used to extend a wrench handle for added leverage unless the wrench was designed for such use.
400.9 Tools shall be used only for the purposes for which they have been approved.
400.10 Tools with sharp edges shall be stored and handled so that they will not cause injury or damage. They shall not be carried in pockets.
400.11 Wooden handles that are loose, cracked, or splintered shall be replaced. The handle shall not be taped or lashed with wire.
400.12 All cutting tools such as saws, wood chisels, drawknives, or axes shall be kept in suitable guards or in special compartments.
400.13 Tools shall not be left lying around where they may cause a person to trip or stumble.
400.14 When working on or above open grating, a canvas or other suitable covering shall be used to cover the grating to prevent tools or parts from dropping to a lower level where others are present or the danger area shall be barricaded or guarded.
400.15 The insulation on hand tools shall not be depended upon to protect users from shock.
400.16 Use suitable handles on all files or tools with pointed tangs.

401  HAND SAWS
401.1 Saws shall always be kept sharpened and properly set so they shall not jump out of the cut.
401.2 Keep your free hand from under cutting edge of saw when making saw cuts.
402 AXES/SLEDGES AND WEDGES
402.1 The ax shall be sharp, the head firmly secured and the handle in good condition.
402.2 Always provide a clear working space. Check for any small brush or branches that might interfere with swinging an ax. Clear overhead obstructions.
402.3 Always work with a good firm footing.
402.4 Always be sure that other workers are in the clear before swinging an ax.
402.5 Axes shall never be taken aloft.

403 ROPE
403.1 New rope shall be inspected throughout its length before being placed in service and shall be inspected on a periodic schedule.
403.2 Rope reinforced with metal strands shall not be used.
403.3 Rope shall not be left in contact with radiators, steam pipes or other sources of heat, or be exposed to acid or acid fumes.
403.4 Defectives rope shall never be used.
403.5 A rope shall not be overloaded or dragged over rough or sharp objects.
403.6 Short bends over sharp-edged surfaces should be avoided.
403.7 Kinks shall be removed before any strain is put on a rope.
403.8 When not in use, rope shall be dried, stored properly, and kept free from mechanical damage and excessive heat and dryness.
403.9 Rope shall be examined regularly for cuts, worn spots, burns and rot. The rope shall be untwisted at various places and inspected for poor fiber and dry rot.
403.10 The outward appearance of rope shall not be accepted as proof of quality or strength.
403.11 The safe load of rope shall not be exceeded.
403.12 Handlines shall have a strength equivalent to one-half inch manila rope.

404 WIRE ROPE
404.1 The working load of a wire rope shall not exceed one-fifth of its rated breaking strength. Wire rope shall be treated with a manufacturer’s approved penetrating lubricant every 30 days. Wire rope shall be replaced, damaged ends removed:
A. When three broken wires are found in one strand of 6x7 wire rope within one lay.
B. When five broken wires are found in one strand of 6x19 wire rope within one lay.
C. When nine broken wires are found in one strand of 6x37 wire rope within one lay.
D. When eight broken wires are found in one strand of 8x19 wire rope within one lay.
E. When marked erosion appears.
404.2 Wire rope of a type not described herein shall be removed from service when four percent of the total number of wires composing such rope is found to be broken in one strand within one lay.
404.3 Worn wires on crown - wire rope shall be replaced when the wires on the crown or the stands are worn down one-third of their original diameter (leaving two-thirds of original diameter intact).
404.4 Kinks - wire rope shall be replaced when the rope has sustained a kink (which has been “pulled through”).

404.5 Corrosion - wire rope shall be replaced when the rope shows marked signs of corrosion.

404.6 Wire rope shall be replaced when the rope has been birdcaged or fatigued beyond the point of performing under normal working tension.

404.7 Wire rope clips shall be inspected for proper installation and tightness.

404.8 Safety fuses or overloading devices shall be used on all winch line operations.

### Wire Ropes-Safe Loads

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*All permissible working loads are based on a safety factor of 5.

405 CABLES AND WIRE ROPE SLINGS

405.1 New cable shall be inspected before being placed in service and shall be tested annually or as otherwise required or specified by the manufacturer. A kinked cable shall never be placed in service.

406 CHAINS

406.1 Use of chains shall be limited to use around sharp edges and used where rope would cause undue kinking or cutting. (Do not use chain in place of wire rope or to extend a wire rope in a winch application.) Chains shall be inspected for:

A. Excessive corrosion;
B. Diameter reducing in link bearing areas; and
C. Defective weld joints on links.

406.2 The user shall inspect new chain before putting it in service. Never splice a chain by inserting a bolt between two links. Never put a strain on a kinked chain. Check for wear, cracks or elongation of links; replace as necessary.
406.3 The user shall inspect each chain before each use. The check shall be for wear, cracks, corrosion, elongation of links, and the capacity on the load limit tag.

406.4 All lifting chains shall be of alloy welded construction, proof tested, and certified with a load limit tag.

406.5 All overhead lifting chains shall have a load limit tag.

406.6 Care shall be taken to avoid “shock” tension being applied on chains.

407 RIGGING, HOISTING, AND CRANE OPERATIONS

407.1 The user shall inspect ropes, slings, hooks, and other fittings for kinks, cuts, wear, weak points and load limit tag before using.

407.2 Defective equipment shall be discarded.

407.3 Inspection of supporting members for chain falls, etc. shall be done before using to assure adequate strength for the load.

407.4 Proper rigging procedure shall be followed.

407.5 Pads should be suitably placed for heavy objects with sharp corners to prevent damage to cable.

407.6 A tag line shall be used to maintain constant control.

407.7 Employees shall stay out from under any load and clear of the angle formed by cables under tension.

407.8 A minimum 10 feet clearance shall be maintained when working near all exposed energized electrical equipment, except where properly covered as allowed in Section 500 of this manual.

408 POWER TOOLS AND EQUIPMENT

408.1 Only trained and qualified employees shall operate power actuated tools.

408.2 The non-current carrying metal parts of portable electric tools such as drills, saws, and grinders shall be effectively grounded when connected to a power source unless:

A. The tool is an approved double-insulated type, or

B. The tool is connected to the power supply by means of an isolating transformer or other isolated power supply, such as a 24v DC system.

408.3 All powered tools shall be examined before use to ensure general serviceability and the presence of all applicable safety devices. The electric cord and electric components shall be given an especially thorough examination.

408.4 Powered tools shall be used only within their capability and shall be operated in accordance with the instructions of the manufacturer.

408.5 All tools shall be kept in good repair and shall be disconnected from the power source while a qualified employee is making repairs.

408.6 Electrical tools shall not be used where there is an imminent hazard of flammable vapors, gases, or dusts.

408.7 Tools connected to a central power supply, including portable and vehicle-mounted generators (not isolated or double insulated) shall be protected by a Ground Fault Circuit Interrupter (GFCI) or by an “assured grounding system”.

408.8 All employees shall be properly clothed and shall use appropriate protective equipment (goggles, gloves, etc.) when operating power actuated tools (pedestal grinders, pipe saws, etc.).
408.9 Extension cords shall be of Underwriter’s Laboratories approved type and maintained in a good condition. Worn or frayed cords and broken plugs shall be repaired by a qualified electrician or discarded.

409 **MACHINE TOOLS**

409.1 An employee shall use only approved tools.
409.2 When not operating, all tools shall be shut off.
409.3 Adjusting, gauging (callipering) of work being done shall not be permitted while the machine is running.
409.4 Guards may be removed only after the machinery is locked out.
409.5 Always keep hands clear. When operating, do not place hands between the tool and material.
409.6 Make sure the rated speed of the wheel is not exceeded. Equip grinding wheels with safety washers. Stand to one side, out of line of flying particles, until wheel reaches top speed.

410 **CHAIN SAWS**

410.1 Only a qualified person shall operate a chain saw.
   A. Employees shall not operate a regular hand-held chain saw without another employee on site with the chain saw operator.
   B. If the hand-held chain saw operator is aloft, the second employee must be able to rescue the chain saw operator.
   C. Chain saws designed and manufactured on fiberglass poles may be operated alone.
410.2 Wear all chain saw safety equipment. For example, hard hat, face shields, chaps, goggles, ear protection, etc.
410.3 Every BWL chain saw shall be equipped with at least two of the following: chain brake, low kickback chain, or reduced kickback bar.
410.4 Gasoline-driven chain saw engine shall be stopped when being refueled. If gas is spilled on chain saw during refueling, it shall be wiped off before engine is started. Chain saws shall not be started within 10 feet of a fueling area.
410.5 Employees shall not approach chain-saw operator within the reach of the saw while the saw is in operation.
410.6 All chain saws shall be equipped with “deadman” controls (controls cannot lock in the “on” position).
410.7 Workers on the ground, not engaged in the sawing operations, shall remain at least eight feet away from the operation.
410.8 The saw must remain attached to work rope all the time it is off the ground, the assisting workers shall maintain control of the work rope while the saw motor is running.

411 **POWDER-ACTUATED TOOLS**

411.1 A qualified employee of a powder-actuated tool shall be trained to clean the tool correctly and to recognize any worn or defective part or defective operation. The operator shall be able to use a powder-actuated tool safely under varying conditions, know the limits of its use, and demonstrate competence by actually operating the tool. The operator shall be able to read the instructions.
411.2 The qualified employee of a powder-actuated tool shall have an operator card that shall be in the operator's possession at all times while using the tool and be presented upon request.

411.3 An operator and assistant using a powder-actuated tool shall be safeguarded by means of eye, head, face, and hearing protection.

411.4 Before using a powder-actuated tool the operator shall inspect it to determine to the operator's satisfaction that it is clean, that all moving parts operate freely, and the barrel is free from obstruction.

411.5 A tool found not to be in proper working order, shall be immediately removed from service and tagged, and not used until repaired.

411.6 A powder-actuated tool shall not be left unattended in a place where it is available to unauthorized persons, and shall not be left loaded.

411.7 Only those employees who are trained and qualified in their operation shall use powder-actuated tools.

411.8 Explosive charges shall be carried and transported in approved containers.

411.9 Prior to use, the operator shall ensure that the protective shield is properly attached to the tool.

411.10 Powder-actuated tools shall not be used in an explosive or flammable atmosphere.

411.11 Tools shall not be loaded until just prior to the intended firing.

411.12 Neither a loaded nor empty powder-actuated tool shall be pointed at any employee. Hands shall be kept clear of the open end.

411.13 A powder-actuated tool shall be tested each day before loading to see that safety devices are in proper working condition.

411.14 Studs or other fasteners used in a powder-actuated tool shall be only those specifically manufactured for use in such tools. Do not interchange cartridges of different manufacturers.

411.15 Only cartridges with an explosive charge adequate for the job and with proper penetration shall be used.

411.16 In case of a misfire, the operator shall hold the tool in place for 30 seconds. He shall then try to operate the tool a second time and then wait another 30 seconds. Misfired cartridges shall be disposed of properly. (Place in metal container and return to Employee-in-Charge).

411.17 Never place your finger on the trigger until the muzzle of the tool is against the work surface.

411.18 Never leave unfired powder loads on floor or work surface.

411.19 Never pry a powder load out of the chamber.

412 AIR NAILEDER

412.1 Only qualified trained employees who are familiar with the operation manual shall use the air nailer.

412.2 Wear eye and hearing protection during operation of the air nailer.

412.3 The tool must be used only for the purpose for which it was designed.

412.4 Operate the tool only when it is in contact with the work piece.

412.5 Never engage in horseplay with the tool.

412.6 Carry the tool by the handle only.

412.7 Never assume the air nailer is empty.

412.8 Disconnect the tool when not in use.

412.9 Do not load fasteners when the tool trigger or work contacting element is depressed. Disconnect from air source.

412.10 Do not disable or remove the work-contacting element.
412.11 Never clamp the trigger in the locked operational position.
412.12 Do not weaken the tool housing.
412.13 Disconnect the air nailer for repair and clearing jams.
412.14 Only male pneumatic type air connectors should be fitted to the tool, so that high-pressure air in the tool is vented to the atmosphere as soon as the air line is disconnected.
412.15 Do not exceed the maximum recommended air pressure.
412.16 Keep the tool clean and lubricated.
412.17 Use only recommended parts and fasteners.

413 PRESSURE WASHER
413.1 Keep away from the spray. High pressure and high velocity fluids can penetrate the skin. Never point the gun at yourself or another person. Never put your hand, fingers, or body directly over the spray tip.
413.2 Before removing the spray tip or servicing the unit, you must not only shut off the washer, but also trigger the gun to release stored pressure.
413.3 Never exceed the pressure rating of any component in the system.
413.4 Never alter or modify equipment.
413.5 Before each use, check for weak, worn or damaged conditions; replace any damaged hose; tighten all fluid connections.
413.6 Do not leave a pressurized unit unattended.
413.7 Do not spray flammable liquids with the pressure washer.
413.8 Never fill the fuel tank while the gas engine is running or hot. Refuel slowly to avoid spillage.
413.9 Do not operate the gas engine in a closed building without adequate ventilation.
413.10 Never make adjustments on the machinery while it is connected to the engine without first removing the ignition cable from the spark plug.
413.11 Never run the gas engine with the governor disconnected, or operate at speeds in excess of manufacturer recommendations.

414 SAND BLASTER
414.1 Only qualified trained employees shall use the sand blaster.
414.2 Always wear NIOSH approved supplied-air respirators as required by MIOSHA.
414.3 Locate supplied-air respirator compressors so as to prevent contaminated air from entering the air intake system.
414.4 Always use a NIOSH approved breathing air hose to connect an appropriate air filter to the respirator.
414.5 Do not connect air filter and respirator hoses to in-plant lines.
414.6 Never modify or substitute remote control parts.
414.7 Inspect the air control orifice for cleanliness before each use.
414.8 Do not exceed maximum working pressure of blast machines and related components.
414.9 Never weld on a blast machine; this can compromise dimensional integrity.
414.10 Point the nozzle only at the structure being blasted, never at yourself or another person.
414.11 Never attempt to manually move the blast machine when it contains abrasive; use mechanical lifting equipment for this.
414.12 Inspect air hoses and blast hoses before each use, and repair leakage or soft spots immediately.
414.13 Keep air hose lengths as short and straight as possible.
414.14 Always shut off the compressor and de-pressurize the blast machine before doing any maintenance.
414.15 Follow the manufacturer’s guidelines for air hose, blast hose, coupling, and nozzle size, selection, and use.

415 HYDRAULIC TOOLS
415.1 Only qualified trained employees shall use hydraulic tools.
415.2 Manufacturer’s safe operating pressure for hydraulic tools, hoses, valves, filters, and fitting shall not be exceeded.
415.3 Pressure shall be released before connections are broken unless quick-acting, self-closing connectors are used.
415.4 Employees shall never attempt to repair a hydraulic leak unless trained and qualified to do so.
415.5 The fluid used in hydraulic-powdered tools shall be fire resistant and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.
415.6 All hydraulic lines longer than 35 feet shall have check valves or provide for loss of insulating value due to partial vacuum when used where they may come into contact with exposed live parts.

416 PNEUMATIC TOOLS
416.1 Only employees who are trained and qualified shall operate pneumatic tools.
416.2 Pneumatic tools shall never be pointed at another person.
416.3 Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.
416.4 Compressed air and compressed air tools shall be used with caution.
416.5 Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.
416.6 Compressed air shall not be used for cleaning purposes except when reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.
416.7 Compressed air shall not be used to blow dust or dirt from clothing.
416.8 The manufacturer’s safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.
416.9 The use of hoses for hoisting or lowering tools shall not be permitted.
416.10 All hoses exceeding one-half inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure or disengagement of a connection.
416.11 Before making adjustments or changing air tools, unless equipped with quick-change connectors, the air shall be shut off at the air supply valve ahead of the hose. The hose shall be bled at the tool before breaking the connection.
416.12 Eye protection, foot protection, and other protective devices shall be worn when their use could reduce the possibility of injury.
416.13 A pneumatic tool used where it may contact exposed live electrical parts shall have a non-conductive hose and an accumulator to collect moisture.
416.14 Employees shall not use any part of their bodies to locate or attempt to stop an air leak.

417 **POWER LAWN MOWERS, EDGERS, ETC.**

417.1 Employees shall ensure that all applicable guards are in place prior to using power lawn mowers.

417.2 All power lawn mowers shall be equipped with adequate guards, which shall remain in place while mower is in use.

417.3 Prior to making adjustments, inspections, or repairs, the employee shall turn off the mower and permit it to come to a complete stop.

417.4 When operating a power mower, the employee shall perform the following:
   A. Remove any rocks, pieces of wire, or other foreign objects from the area to be mowed.
   B. Avoid placing the body in front of the discharge opening.
   C. Move a walk-behind mower across the face of a slope of more than 17 degrees, never up and down, except by use of a rope to raise and lower the mower while standing at the top of the slope.
   D. Do not operate riding grounds-keeping equipment up or down a slope of more than 26 degrees or move across the face of a slope of more than 17 degrees.
   E. Wear proper protective equipment to include, as a minimum, safety glasses or safety goggles, and appropriate hearing protection (Safety footwear shall be worn).

418 **WELDING, CUTTING, AND BRAZING**

418.1 Only qualified persons wearing the appropriate personal protective equipment shall use arc or flame welding and cutting equipment.

418.2 A fire extinguisher shall be on the job site.

418.3 The welder shall shield or barricade the welding operations in order to protect others from splatter and harmful rays.

418.4 The welder shall shield or barricade the welding operations in order to prevent ignition of flammable material.

418.5 Scrap rod shall be immediately and properly disposed of.

418.6 All hot material shall not be left unguarded unless plainly marked “Hot”.

418.7 Cables or hoses used in welding operations that cross walkways shall be suspended or bridged with planking to protect the cables or hoses from traffic.

418.8 The welder shall periodically check the equipment.

418.9 Hot work permits shall be done when welding, burning, or brazing, as a precaution and guarding of hazards (such as fire, explosives, toxic fumes and electric shock). A coworker shall be assigned to assist welders at elevated work areas for unexpected emergencies.

418.10 Adequate ventilation or approved breathing apparatus shall be provided while welding in confined spaces or while brazing, cutting or welding any zinc, brass, bronze, galvanized or lead-coated material.

418.11 Do not weld on a closed container unless it is vented.

418.12 Do not weld or cut a tank that has contained flammables until it has been thoroughly cleaned, filled with water and adequately vented. Only qualified welders shall perform work of this type.

418.13 The torch shall be held away from the body and other persons when it is ignited.
418.14 Should a torch flashback occur, cylinder valves shall be closed quickly; then check hose, regulators and torch for damage. Check tip for plugging before attempting to re-light. Periodic blowing of lines with dry and filtered air is advocated.

418.15 Regulators, valves, cylinders, or hose connections of gas welding equipment should not come in contact with oil or grease as foreign materials within the equipment when under pressure may become explosive.

418.16 A fire watch shall be maintained wherever welding or cutting is performed in locations where combustible materials present a fire hazard. A fire check shall be made of the area one-half hour after completion of welding.

418.17 Where combustible materials such as paper clippings or wood shavings are present, the floor shall be swept clean for a radius of 35 feet before welding. Combustible floors shall be kept wet or protected by fire-resistance shields. Where floors have been wetted down, personnel operating arc welding or cutting equipment shall be protected from possible shock.

418.18 Proper protective equipment shall be worn during welding and cutting work, including hard hat, approved goggles or hood, long-cuffed gloves and fire retardant or leather clothing. The specific protection depends upon the job hazard, but clothing shall be free of excessive oil or grease, and outer garments shall be fastened at neck and ankles.

418.19 Proper eye protection shall be worn to guard against flying particles when the helmet or goggles are raised.

418.20 In dusty or gaseous spaces where there is a possibility of an explosion, welding or cutting equipment shall not be used until the space is adequately ventilated.

418.21 Potentially hazardous materials in fluxes, coatings, covering, and filler metals are released to the atmosphere during welding and cutting operations. While welding or cutting, adequate ventilation or approved respiratory protection equipment shall be used. Special precautions shall be taken when using materials that contain cadmium, fluorides, mercury, chlorinated hydrocarbons, stainless steel, zinc, galvanized materials, beryllium, and lead. Employees shall refer to the BWL’s hazard communication program for specific requirements pertaining to the above listed hazardous materials.

418.22 Gas welding and cutting: Only approved gas welding or cutting equipment shall be used.
A. Approved back flow check valves shall be used on gas welding rigs in both gas and oxygen lines.
B. Welding hose shall not be repaired with tape.
C. Matches shall not be used to light a torch; a torch shall not be lighted on hot work. A friction lighter or other approved device shall be used.
D. Oxygen or fuel gas cylinders shall not be taken into confined spaces.

418.23 All regulators shall be equipped with check valves to prevent accidental back flow of gases. Always be certain that all connections are free of contaminants (such as oil, grease, moisture, etc.).

418.24 Electric Welding: Only approved electric welding equipment shall be used:
A. The electric welding machine shall be properly grounded before use.
B. Rules and instructions supplied by the manufacturer or affixed to the machine shall be followed.
C. Welders shall not strike arc with an electrode, whenever persons are nearby who might be affected by the arc.

D. When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected so that they cannot make electrical contacts with employees or conducting objects.

E. When the welder must leave the work or stop work for any appreciable length or time, or when the welding machine is to be moved, the power supply switch to the equipment shall be opened.

418.25 All welding outlets that do not have a quick disconnect device for the individual outlet shall be electrical cleared prior to connecting or disconnecting the weld plug.

418.26 Welders or their helpers shall not carry matches or butane lighters when engaged in welding or cutting operations.

418.27 An electric welding machine shall be properly grounded before using, avoid accidental contact of the electrode to ground. Equipment shall always be maintained in proper operating condition with the ground wire being of ample size to prevent overheating. Grounding connections shall be secure at all times.

418.28 The welder shall always be aware of the direction the torch is aimed when not welding to avoid contact with other people.

418.29 Area levels below an open work area shall be guarded from falling objects, welding sparks, and rod and waste materials by providing a suitable covering (such as plywood sheets or canvas) for the opening.

419 COMPRESSED GASES

419.1 Gas cylinders shall be fastened securely in an upright position at all times. Turn off cylinder valves before leaving the work site. Leave valves closed and cap on empty cylinders.

419.2 Cylinder gas shall only be used for its intended purpose.

419.3 Care shall be exercised in handling all compressed-gas cylinders. They shall not be dropped, jarred, or exposed to temperature extremes.

419.4 Cylinders shall have the valve cap or valve protection device in place at all times, except when in actual use or connected to a welding set.

419.5 Cylinders shall not be rolled and shall not be lifted by the valve or valve cap; a suitable cradle or other device shall be used.

419.6 Cylinders shall have their contents properly identified.

419.7 Cylinders not having fixed hand wheels shall have keys, handles, or non-adjustable wrenches on the valve stems while the cylinders are in service.

419.8 Compressed-gas cylinders, whether full or empty, shall be stored in an upright position and chained or otherwise secured so they cannot fall or be upset. Cylinders shall be stored away from highly combustible material and separated from sources of heat such as direct sunlight, radiators, and furnaces. All empty compressed gas cylinders shall be marked or tagged as empty and secured.

419.9 Compressed-gas cylinders shall not be stored or used at a temperature exceeding 125 degrees Fahrenheit.

419.10 Storage means the storage of filled or empty cylinders not in use. Oxidizing and fuel gas cylinders or cylinders used as a unit shall not be considered in storage.
419.11 When powered vehicles transport cylinders, they shall be secured in a vertical upright position with the valve cap or valve protection device in place.

419.12 Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease) by a minimum distance of 20 feet or a five feet high non-combustible barrier.

419.13 Cylinders shall not be placed where they might become part of an electric circuit or within five feet of an electrical outlet.

419.14 Hydrogen and fuel gas cylinders shall not be stored inside any operating building. Separate storage buildings or sheltered storage areas shall be used.

419.15 Employees shall never force connections that do not fit nor shall they tamper with the safety relief devices of cylinders.

419.16 Before the regulator is removed from a cylinder, the valve shall be closed and all pressure released from the regular.

419.17 A leaking cylinder shall not be used. Such cylinders shall be taken outdoors away from sources of ignition, secured, and identified. The Employee-in-Charge shall be notified.

419.18 A flame shall never be used to detect gas leaks.

419.19 The recessed top of cylinders shall not be used as a place for tools.

419.20 No attempt shall be made to mix gases in a cylinder or to transfer gas from one cylinder to another.

419.21 A sign “Danger - No Smoking, Matches, or Open Lights” or one with equivalent wording shall be conspicuously posted in rooms or at entrances to areas where fuel gas is used or stored.

419.22 No one shall stand in front of regulator when compressed gas cylinders are being opened.

419.23 The user shall inspect all hoses and fittings for holes and thread conditions before connections are made.

419.24 Hydrogen: Special precautions shall be taken when using hydrogen to avoid the possibility of fire and explosion. “Danger - No Smoking” signs shall be posted where hydrogen is used or stored.

419.25 Oxygen: Oil, grease, or similar materials shall not be allowed to come in contact with any valve, fitting, regulator, or gauge of oxygen cylinders.
   A. Oxygen shall never be used as a substitute for compressed air.
   B. When an oxygen cylinder is in use, the valve should be opened fully to prevent leakage around the valve stem.

419.26 Acetylene: Acetylene cylinders shall be properly secured and always used, transported, or stored in a vertical position. Cylinders shall be protected from sparks, flames, and contact with energized electrical equipment.
   A. An acetylene cylinder valve shall not be opened more than one and one-half turns of the spindle and preferably no more than three-fourths of a turn.
   B. Employees shall not use acetylene in a free state at pressures higher than 15 psi.

419.27 Chlorine: See Section 1010 – Chlorine.

420 COMPRESSED AIR

420.1 Hoses and hose couplings shall be checked for loose connections, defects, etc. before using.
420.2 When using compressed air for cleaning equipment or work areas, proper protective equipment (safety goggles, face shield, gloves, air relief nozzle, etc.) shall be worn. The maximum of 30 pounds psi shall not be exceeded.

420.3 Compressed air shall not be used to clean off one’s clothing or body.

420.4 Compressed air shall not be used to empty containers not designed for this purpose.

420.5 Only air hose and coupling with safety chains or equivalent, designed for compressed air, shall be used in connection with compressed air lines.

420.6 Prior to use, hoses shall be inspected for cracks, bulges, and splits.

420.7 All compressors shall be equipped with safety valves.

420.8 Hoses shall be connected and secured prior to pressurizing.

420.9 Hose connectors shall be of the approved self-locking type.

421 SAFE SUPPORT AND SCAFFOLDS

421.1 No employee, or any material or equipment shall be supported or permitted to be supported on any portion of a pole structure, scaffold, ladder, walkway, or other elevated structure, crane or derrick, etc. without it first being determined that such support is adequately strong and properly secured in place.

421.2 Employees shall check all scaffolding before use to ensure it is of sufficient strength and rigidity to safely support the weight of persons and materials to which it will be subjected.

421.3 Employees shall not use a scaffold from four to 10 feet in height having minimum horizontal dimension of less than 45 inches unless proper guardrails are present to provide employee protection.

421.4 Employees shall not use a scaffold over 10 feet in height unless a standard guardrail, with midrail and toeboards, is present to provide adequate employee protection.

421.5 Scaffold planks shall extend over their supports by not less than six inches (unless cleated) and not more than 12 inches.

421.6 Scaffolds shall not be moved without first removing all loose tools, materials, and equipment resting on the scaffold deck.

421.7 All scaffolds shall be sufficiently secured and braced.

421.8 The footing or anchorage points for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.

421.9 Scaffolds shall not be altered or moved horizontally while being used or occupied except when specifically designed for such use. Movable scaffolds shall have the casters or wheels locked to prevent movement.

421.10 The width of all scaffolds, ramps, and platforms shall be sufficient to prevent congestion of persons, materials, or equipment, and in no case shall they be less than 18 inches wide.

421.11 Rope shall not be used as guardrails.

421.12 Employees working on suspended scaffolds shall be protected by an independent lifeline, body harness, and a lanyard.

421.13 Safe access shall be provided for all scaffolds. Structural members should not be used as a means of access.
422 WORKING ALOFT
422.1 Fall protection hazards related to working aloft shall be addressed using rule 220 – Fall Protection and Prevention.
422.2 Climbing to a working position aloft shall be by means of approved ladders.
422.3 Tool bags and hand lines shall be used when providing tools, equipment, or materials to the employee aloft.
422.4 When aloft, tools and materials shall be secured at all times.
422.5 No object, tool, material, etc. shall be permitted to be thrown to the worker aloft, or dropped to an employee at any level below a work station.
422.6 At the work level, adequate protection shall be made to protect the level immediately below.

423 LADDERS - GENERAL
423.1 Portable ladders shall be approved non-conductive ladders. Never climb on make-shifts, stock, machinery, etc.
423.2 All ladders shall be inspected before each use. Ladders with weakened, broken, or missing steps, broken side rails, or other defects shall be tagged and removed from service.
423.3 Rungs and steps shall be kept clean and free of grease and oil.
423.4 A portable ladder shall not be loaded in excess of the duty rating. Ladders without a legible tag stating the duty rating shall not be used.
423.5 Wooden ladders shall not be painted. Only a clear non-conductive finish shall be applied.
423.6 Adequate clearances shall be maintained when transporting ladders to avoid bumping into machinery, benches, energized equipment, etc.
423.7 Appropriate precautions shall be taken when placing a portable ladder near a door or aisle through which there is any type of traffic. Precautions may include warning signs, blocking the door open or having an employee guard the door way.
423.8 Ladders shall not be used in a horizontal position as a platform or scaffold.
423.9 A ladder shall not be placed on a box, barrel, or other unstable base.
423.10 A ladder-leveling device shall be used if an uneven surface cannot be avoided.
423.11 An employee shall face the ladder and use both hands when climbing up or down.
423.12 An employee shall not stand astride a ladder and another object.
423.13 Special consideration shall be given so that tools and materials carried in pockets, pouches or belts do not protrude to catch on ladder rungs.
423.14 An employee shall maintain three points of contact when using a ladder and shall not work or reach any farther than arm’s length from the ladder to avoid losing balance.
423.15 Ladders used to gain access to a roof or other elevated position shall extend at least 3 feet above the point of support.
423.16 Ladders shall not be spliced together to form a longer ladder.
423.17 A ladder shall not be placed against an unsafe support.

424 STEPLADDERS
424.1 Stepladder legs shall be fully spread and the spreading bars locked in place.
424.2 Stepladders shall not be used as a straight ladder.
424.3 When an employee is working more than 10 feet high on a stepladder (except a platform ladder) the stepladder shall be held by another person.
424.4 Stepladder longer than 20 feet shall not be used.
424.5 The top of a step ladder shall not be used as a step.

425 STRAIGHT OR EXTENSION LADDERS
425.1 Keep the distance from the ladder’s base to the wall one-fourth the distance from the base to its point of top support.
425.2 All straight or extension ladders shall be equipped with securing devices and approved safety feet. Where safety feet do not overcome the hazard of slipping, the ladder shall be secured by tying or other adequate means.
425.3 Extension ladders should be overlapped at least:
   A. Four feet for lengths up to 36 feet.
   B. Five feet for lengths from 36 to 48 feet.
   C. Six feet for lengths from 48 to 60 feet.
425.4 Only one employee shall work from a ladder at one time, except for properly rated hook ladders or those designed to support two people.
425.5 When working from straight ladders the ladder must be securely placed, held, tied or otherwise secured.
425.6 Straight ladders shall not be climbed beyond the third step from the top.

426 LASERS
426.1 BWL shall maintain a written Laser Safety Program with procedures for equipment purchase, use, training, record keeping and employee safety.
426.2 The BWL Laser Safety Officer shall approve the purchase of all new Laser equipment.
426.3 It is the responsibility of the employee/contractor operating the Laser equipment to protect the employees in the area from exposure to the Laser beam and to make sure the proper warning signs are posted.
426.4 Only a qualified BWL Laser operator may perform routine site maintenance of specific Lasers according to the manufacturer’s operating instructions.
426.5 No BWL employee shall attempt repair of Laser equipment.
SECTION 500
ELECTRIC RULES

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500 **DEFINITIONS**

500.1 Voltage is used as follows: All references to specific voltages (primary or secondary) are to nominal supply line voltages and exclude communication circuits. These voltages may vary within the accepted practices established by the Board of Water and Light.

500.2 Rubber Gloves as referred to in this manual is limited to the gloves that are approved for use on primary voltages and are regularly worn by lineworkers and qualified electrical workers.

500.3 The term “energized lines” as used herein is defined as any conductor, including neutral conductors, apparatus or part thereof, capable of being energized at or above 50 volts. This also includes street light conductors, communications lines, and lines of a similar nature.

500.4 The term “primary lines” as used herein is defined as any conductor, including neutral conductors and apparatus or part thereof, capable of being energized at or above 600 volts.

500.5 Equipotential Zone: A safe work zone created by placing a grounding cluster on the pole below and as close as possible to where the lineman will be standing and installing grounds from the line to the grounding cluster. This grounding scheme is specifically designed to prevent employees from being exposed to differences in potential. This scheme requires the following:
   A. One set of personal protective grounds.
   B. One grounding cluster used on the work pole.
   C. Connection from grounding cluster to system neutral (if applicable).
   D. Ground connection from grounding cluster to center phase.
   E. Short circuit remaining phases and remove excess slack from grounding cable.
   F. Work to be performed about grounding cluster.

500.6 Bracket Grounding: A grounding scheme in which personal protective grounds are installed on both sides, and within one span of the work areas:
   A. Two sets of personal protective grounds.
   B. Two grounding clusters.
   C. Connection from grounding cluster to system neutral (if applicable).
   D. Ground connection from grounding cluster to center phase.
   E. Short circuit remaining phases and remove excess slack from grounding cables.

500.7 Qualified Employee (qualified person): One knowledgeable in the construction and operation of the electric power generation transmission and distribution equipment involved, along with the associated hazards.

500.8 Voltage: The effective (RMS) potential difference between any two conductors or between a conductor and ground. The voltage specified in this manual shall mean the maximum effective voltage to which the personnel or protective equipment may be subjected. Low voltage includes voltages up to 600 volts. High voltage or Primary Lines shall mean voltages in excess of 600 volts.

501 **SAFE WORKING DISTANCES**

501.1 Without a protective barrier and protective equipment, qualified workers shall not approach closer to any exposed energized equipment or conductors than a distance specified below. The distance specified must be increased by the appropriate amount whenever conducting tools or materials are used to
extend the reach of a qualified worker. Non-qualified employees must maintain a minimum clearance of 10 feet up to 50 kV.

<table>
<thead>
<tr>
<th>Nominal System Phase to Phase Voltage</th>
<th>Phase to Ground Exposure * (Feet-Inches)</th>
<th>Phase to Phase Exposure * (Feet-Inches)</th>
<th>Phase to Phase and Phase to Ground Safe Working Distances ** (Feet-Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 to 300</td>
<td>Avoid contact</td>
<td>Avoid contact</td>
<td>Avoid contact</td>
</tr>
<tr>
<td>301 to 750</td>
<td><strong>1’1”</strong></td>
<td><strong>2’1”</strong></td>
<td>2 feet</td>
</tr>
<tr>
<td>751 to 5,000</td>
<td><strong>2’1”</strong></td>
<td><strong>3’</strong></td>
<td>3 feet</td>
</tr>
<tr>
<td>5,100 to 15,000</td>
<td><strong>2’2”</strong></td>
<td><strong>3’3”</strong></td>
<td>3 feet</td>
</tr>
<tr>
<td>15.1 kV to 36 kV</td>
<td><strong>2’7”</strong></td>
<td><strong>3’10”</strong></td>
<td>4 feet</td>
</tr>
<tr>
<td>36.1 kV to 46 kV</td>
<td><strong>2’10”</strong></td>
<td><strong>3’3”</strong></td>
<td>4 feet</td>
</tr>
<tr>
<td>46.1 kV to 72.5 kV</td>
<td><strong>3’4”</strong></td>
<td><strong>4’</strong></td>
<td>4 feet</td>
</tr>
<tr>
<td>72.6 kV to 121 kV</td>
<td><strong>3’9”</strong></td>
<td><strong>4’8”</strong></td>
<td>4 feet</td>
</tr>
<tr>
<td>121.1 kV to 145 kV</td>
<td><strong>4’4”</strong></td>
<td><strong>5’5”</strong></td>
<td>7 feet</td>
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</tbody>
</table>

*Minimum Working Distances required by MIOSHA, Part 86. For reference only. **The safe working distances are more restrictive than MIOSHA, Part 86.

502 PROTECTIVE EQUIPMENT

502.1 In applying rubber protective equipment, employees should always protect the nearest and lowest wires first, protecting the worker as the worker progresses. In removing rubber protective equipment, the reverse order shall be maintained. Protective equipment shall be applied from a position underneath the conductor when possible.

502.2 20 kV gloves shall never be worn inside out or without leather protectors. They shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of them. Leather protectors shall not be worn except when in use over rubber 20 kV gloves, although old leather protectors properly identified, maybe used as a work glove.

502.3 20 kV gloves and 20 kV sleeves shall be put on before entering the primary zone and shall not be removed until the employee is completely out of the primary zone.

502.4 In service care and use of electric protective equipment, the employee shall inspect items for damage before each day’s use and any time damage is suspected during use.

A. Protective rubber gloves must be given a minimum 20-second air test before each day’s use and when damage is suspected.

B. Any insulating equipment with any of the following defects shall not be used:
   1. Hole, tear, puncture or cut.
   2. Ozone cutting or ozone checking.
   3. An embedded foreign object.
   4. Any texture changes such as swelling, softening, hardening, or becoming sticky or inelastic.

C. Insulating equipment shall be cleaned as needed to remove foreign substances.

D. Employees are responsible for tagging any defective protective equipment and turning it in for testing and repair.
E. Insulating equipment shall be stored in such a manner and location to protect it from light, temperature extremes, excessive humidity, ozone, and other injurious substances and conditions.

F. Protective gloves shall be worn over insulating gloves except:
   1. For class "0", (300 volts and below).
   2. Under limited use conditions such as working with small equipment and parts where manipulations necessitate unusually high finger dexterity.

502.5 Rubber protective equipment, including mechanical jumpers, allowed to remain in place on energized lines, or apparatus overnight, or longer, shall be cleaned and tested before re-use.

502.6 Rubber goods shall be tested upon being received from the manufacturer and shall be submitted for re-testing as follows:

<table>
<thead>
<tr>
<th>Rubber Insulating Equipment Test Intervals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of equipment</td>
</tr>
<tr>
<td>Rubber insulating line hose</td>
</tr>
<tr>
<td>Rubber insulating covers</td>
</tr>
<tr>
<td>Rubber insulating blankets</td>
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<tr>
<td>Rubber insulating gloves</td>
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<td>Rubber insulating sleeves</td>
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(1) Electrically tested insulating equipment maintained as stock (not made available for use) shall be re-tested within a 12 month period and before it is made available for use.
(2) Electrically tested insulating equipment that is available for use but not issued shall be re-tested within a six month period and 30 days from first day of use.

502.7 Each employee who is exposed to the hazards of flames or electric arcs will not wear clothing that, when exposed to these flames or electric arcs, could increase the extent of injury that would be sustained by the employee. Clothing made from the following types of fabrics either alone or in blends is prohibited: Acetate, Nylon, Polyester, or Rayon.

When work is performed on energized parts or equipment, employees shall cover (with proper protective devices) or remove all exposed conductive articles, (such as key or watch chains, rings, ear rings, etc., wrist watches, wrist bands, and eye glasses with metal frames).

502.8 Workers shall wear 20 kV rubber gloves with leather protectors when working on lines or equipment energized at voltages from 600 to 8500 phase to ground. Additional protection shall be required as follows:
A. 20 kV rubber sleeves shall be worn whenever work is performed within overhead primary zone.
B. Rubber blankets, line hose and other protective devices shall be used to avoid accidental contact with nearby grounds or energized circuits. This shall apply on wood poles or wood structures. When working on metal structures, added protective equipment such as wood platforms, rubber mats, etc. shall be used.

502.9 20 kV rubber gloves and sleeves shall be worn when operating gang operated air break switches from the ground even though the switch handles are grounded.
502.10 20 kV rubber gloves and sleeves shall be worn when stringing conductors near primary lines or exposed live parts.

502.11 20 kV rubber gloves and sleeves shall be worn when raising or lowering poles between or near primary lines or exposed live parts.

502.12 20 kV rubber gloves shall be worn when moving or changing ground wires or neutrals on energized equipment.

502.13 Class “0” or greater rubber gloves shall be worn when working aloft with 120 to 600 volts on any metal structure.

502.14 20 kV gloves and sleeves shall be worn when working on neutral when it is in the primary position.

502.15 20 kV rubber gloves shall be worn when any set of circumstances exists that the worker may consider it advisable for their safety.

502.16 20 kV rubber gloves shall be worn while checking for potential with an approved voltage testing device on systems over 600 volts, except when using an approved single stick tester on overhead lines.

502.17 20 kV rubber gloves shall be worn while operating or inspecting underground equipment such as subway transformers, oil switches, oil filled cutouts, RCOC switches, cable, terminals, disconnects, or any other equipment whose operating voltage is over 600 volts.

502.18 20 kV rubber gloves shall be worn while rodding in ducts containing energized cables and wires, and while pulling out any abandoned lead cables from ducts carrying energized cables.

502.19 20 kV rubber gloves shall be worn while standing on the ground and operating the controls of boom-type equipment where contact with primary conductors is possible.

502.20 20 kV rubber gloves and sleeves shall be worn while placing and removing line hose, hoods, blankets and other protective equipment used with lines and equipment energized in excess of 600 volts.

502.21 20 kV rubber gloves shall be worn when the primary side of a live front padmount transformer is open.

503 HOT LINE TOOLS

503.1 When hot line stick work is being performed, only fiberglass hot line tools that are approved shall be used.

503.2 Do not place hot line tools on the ground or permit them to touch the ground when lowering from poles or structures.

503.3 Hot line tools must be kept dry, clean, and free of moisture. Do not store in damp areas. These tools shall be thoroughly dried out at intervals when necessary.

503.4 When transporting hot line tools, keep them rolled in a canvas tarpaulin with one layer of canvas between each tool to prevent scars or abrasions. Use separate and larger canvas to place on the ground. When racks are provided on trucks or trailers for transporting tools, they should be well padded. Employee-in-Charge shall see that hot line tools that are constantly transported on trucks or trailers shall be regularly checked and refinished as often as necessary to keep them in first-class condition. The worker shall also check the tools before using. Employee-in-Charge shall be responsible to see that the sticks are returned to the trailer, cleaned, and stored properly.

503.5 When inspecting hot line tools, look for signs that indicate the tool has been over-stressed. Indications may include bent or cracked parts, bent rivets or bolts and cracked glue joints that indicate that ferrules have slipped, and
damage to a wood member. Check detachable or bolted fittings to be sure fastenings have not loosened and look for excessive wear. Broken or damaged hot line tools shall not be used. They shall be destroyed or returned to the manufacturer to be properly repaired.

503.6 Live line tools and equipment shall be wiped clean and carefully inspected before use. At least once a year, or more frequent if necessary, live line tools and equipment shall be taken out of service, inspected and dielectric tested. Tests shall be completed and documented by a qualified person(s). Live line tools that are new, rarely used, and stored in a safe place may be excluded from annual testing and be tested every two years. All live line tools shall be tagged, indicating testing date.

504  RECLOSURES
504.1 Reclosures may not be used as Clearance points. Only devices providing a visual air opening shall be used for employee protection such as an open switch or open jumper. This visual open may be at a reclosure location but the open will be the Clearance point. When Clearance is given, a Clearance tag will be place on or as near as practical to the open.

504.2 Automatic reclosing devices shall be deactivated whenever there is a possibility that reclosing shall endanger personnel. Reclosures placed on non-auto reclosing shall be caution tagged.

505  RADIOS
505.1 At any time a crew is working on a primary circuit, the circuit numbers and location shall be displayed near the truck radio.

506  TESTING FOR POTENTIAL
506.1 Electrical equipment and lines shall always be considered as “live” unless they are positively known to be dead and are grounded. Before starting to work, preliminary inspection or test shall be made to determine what conditions exist.

507  GROUNDING
507.1 For employees to work lines or equipment as de-energized, the lines shall be de-energized, tested, and shall be grounded.

507.2 Equipotential Zone – Temporary protective grounds shall be placed in such a manner as to prevent employees from being exposed to differences in electrical potential.

507.3 Protective grounding equipment shall consist of cables and conductors designed specifically for use as personal protective grounds and capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault. The grounding conductors shall be a minimum of 1/0 copper. For complete grounding requirements on the BWL system refer to Electric T & D Policy and Procedure Manual, Section 12 – Personal Protective Grounding.

507.4 Testing - Before any ground is installed, lines and equipment shall be tested and found absent of nominal voltage.

507.5 Order of Connection – When attaching grounds, the ground end shall be attached first and then the other end shall be attached by means of insulated tools. Exception – When conditions exist that do not allow the use of insulated tools, other suitable devices may be utilized.
507.6 Order of Removal – When a ground is to be removed the grounding device shall be removed first from the line or equipment by means of insulated tools. Exception – When conditions exist that do not allow the use of insulated tools, other suitable devices may be utilized.

507.7 Grounds may be removed temporarily during tests. During the test procedure the employer shall ensure that each employee:
A. Uses insulating equipment, and is isolated from any hazards involved.
B. The employer shall also institute any additional measures to protect each employee in case of previously grounded lines and equipment was to become energized.

508 INCLEMENT WEATHER
508.1 Before any work on the primary system is started, anticipated weather conditions for the day shall be given consideration. If a hazardous condition (i.e., rain, fog, high humidity, high winds, snow or ice storms) develops while work is in progress and the job must be completed or made safe, the circuit shall be de-energized and grounded before the work is completed.

508.2 Except during emergency restoration, work may be discontinued when adverse weather conditions would make the work hazardous. Adverse weather conditions are defined as:
A. Thunderstorms in the immediate vicinity.
B. High winds (40 mph or greater).
C. Snow storms.
D. Ice storms.

509 STORM RESTORATION
509.1 Whenever it is necessary to patrol lines during the day or night and conditions make it potentially unsafe to patrol with one person, additional help shall be provided.

509.2 Whenever there is a system disturbance due to downed wires, poles, or trees, each employee must recognize the potential dangers and proceed with caution.

509.3 Only qualified journey workers or qualified apprentices shall handle damaged wires directly. Other personnel shall not enter the immediate trouble area to work unless under direct supervision of a journey worker qualified in electrical work.

509.4 In the event of a major system disturbance so extensive that restoration of service, done with the use of journey worker or journey worker supervision, within a reasonable length of time is impossible, these work areas shall be made safe or the power source de-energized.

510 WORKING ALOFT
510.1 Only BWL-approved belts, harnesses and lanyards shall be used.
510.2 No material shall be dropped from a pole unless absolutely necessary, then this shall be done under the direction of the Employee-in-Charge. The drop zone shall always be guarded and cleared.
510.3 Any pole found to be unsafe shall be adequately guyed or otherwise supported before pole is climbed.
510.4 When there is an injury on a pole that requires the lineworker to be removed, there shall be an ambulance and a ladder truck requested immediately; there
shall be no exceptions. Any additional equipment needed shall be dispatched by the BWL. This procedure shall be posted at BESOC.

510.5 All overhead crews shall practice pole top rescue and bucket rescue annually.

510.6 When it is necessary for a lineworker to transfer from the pole to the bucket or from the bucket to the pole this shall be considered a special cause and shall be approved by the Employee-in-Charge. The lineworker’s safety strap shall always be fastened to either the pole or the approved ring of the insulated bucket or boom.

510.7 Climbers shall not be worn in the bucket except as necessary and as explained by the previous rule.

510.8 20 kV rubber gloves and sleeves shall be put on before entering the work area within which energized lines or apparatus may be reached, and shall not be removed until the employee is completely out of reach of this area.

510.9 The minimum required protection for qualified employees when working energized primary lines or equipment shall be 20 kV rubber gloves and sleeves.

510.10 When the basket is in the primary zone, care shall be used so as not to introduce any conducting media between basket and ground or between two phases.

511 AERIAL LIFTS

511.1 See Rule 508.2 in this manual.

511.2 Workers must wear a full body harness with a shock-absorbing lanyard attached to the designated attachment point on the aerial lift.

512 CLIMBING AND WORKING ON POLES

512.1 Before climbing through, passing between, or positioning oneself in a primary area, all conductors of 600 volts and above shall be covered with necessary protective devices. The uncovered portion shall be only that which is to be worked on and shall be one phase or neutral at a time.

512.2 Lineworkers shall not wear their climbers while driving vehicles, when doing work on the ground, on ladders, in buckets or platforms in which the wearing of the climbers causes a hazard unless co-workers are working on primary conductors.

512.3 When not climbing or when the climbers are stored, gaff guards shall be in place.

512.4 Employees shall not work on an elevated pole or structure without securing themselves with an approved fall restraint device.

512.5 Protective body belts, safety straps, lanyards, life lines and body harness shall be inspected before use each day and any time damage is suspected.

513 OVERHEAD ENERGIZED LINES AND EQUIPMENT

513.1 Only as a reflection of a custom in the electric utility industry to express, specifically, in a collective bargaining agreement, as well as in the “Safety Rules,” the understanding of the parties to the particular agreement on this aspect of electric utility work - the parties hereto agree that two or more employees, qualified in the judgment of the immediate Employee-in-Charge of the job, shall work together whenever wires or equipment are energized at more than 600 volts to ground, or in the judgment of the Employee-in-Charge of the job, wiring is congested or unusual exposure is involved. Work on conductors energized in excess of 8,500 volts, phase to phase, must be
performed with hot stick tools or with 20 kV gloves and 20 kV sleeves from an approved aerial lift.

513.2 Normal practice shall be to work two lineworkers in the primary zone. During the time an employee is doing work on any energized part of the line over 600 volts, the other employee shall act as an observer, for the purpose for preventing an accident but may assist when working on the same phase. When both lineworkers are working aloft in the primary zone, a safety watcher shall be present. This person must have working knowledge of overhead line work and the BWL Safety Manual. They shall also have a BWL radio unit immediately available and be trained in proper radio procedures including pole top rescue.

514 CLEARING OF DOWNED PRIMARY BY ONE QUALIFIED LINEWORKER

514.1 In case of an emergency were danger of life or property imminent, one journey line worker may clear the hazard without assistance, if in the line worker's judgment it can be done safely.

514.2 In an emergency situation, clearing of down primary lines by one qualified line worker is permitted providing one of the following methods is used:
A. 20 kV gloves and sleeves from an approved aerial lift device, or
B. Approved hot line cutters and/or hot line tools.

515 FUSES, CUTOUTS, AND DISCONNECTS

515.1 The operating of switches and cutouts energized at 600 volts or above does not constitute the “working directly on” of energized equipment and as such may be completed in an approved manner by a single qualified employee.

515.2 Blown fuses located at risers supplying underground distribution shall not be refused until the cable is tested with an approved testing device. Testing shall be done by a qualified employee trained in the use of the test device.
A. In the case of a fuse blown due to obvious physical evidence (i.e., animal, bird, tree limb, kite string, etc.) a qualified lineworker may replace the fuse without testing, if in the employee’s judgment it can be done safely.

515.3 Two qualified employees in the primary zone are required to change out current-limiting fuses (K-Mates).

515.4 When opening or closing fused cutouts, using load pickup jumpers, or picking up load, the workers shall wear the necessary personal protective equipment including eye protection to avoid injury from electric contacts, arc, or flash.

516 TRANSFORMERS

516.1 The primary lead(s) of a distribution transformer shall be considered energized at primary full voltage until both the primary and secondary leads have been disconnected or it has been disconnected or it has been definitely determined that the secondary circuit to which the transformer is attached has been de-energized and grounded.

516.2 The cases of all transformers connected to a source of supply shall be considered as being energized at the full primary voltage unless they are adequately grounded.

516.3 When performing work on the primary leads or cutouts connected to a distribution transformer, without 20 kV rubber gloves and sleeves, the secondary leads shall be disconnected.
517 CAPACITORS, REGULATORS, RECLOSERS
517.1 Before qualified employees work on capacitors, the capacitor shall be disconnected from energized sources. After five minutes from the time of disconnection the capacitor shall be short circuited and a shorting wire installed.
517.2 Only a qualified employee wearing proper personal protective equipment may open or close a capacitor bank using the designated control device or an approved live line tool.
517.3 When de-energizing capacitors installed on an ungrounded substation rack the rack shall be bonded to ground before the capacitors are short circuited and grounded.
517.4 Any line to which a capacitor is connected shall be short circuited before being considered de-energized.
517.5 Before high voltage capacitors are handled and stored they must be short-circuited and grounded. When in storage they will have a shorting wire in place.
517.6 When a fuse is open at a capacitor location and there is no visible sign of external damage, all capacitor tanks shall be tested before they are reenergized.
517.7 All capacitors, regulators, or reclosers, shall be opened or closed by a qualified employee using the proper control device and/or from an approved insulated aerial device, wearing personal protective equipment.
517.8 All capacitors’ cutouts shall be opened with an approved load break device.
517.9 When a fuse is open at a capacitor location and no visible signs of an external damage, all capacitor tanks shall be tested before they are re-energized.

518 STRINGING AND REMOVING WIRES
518.1 Whenever wires are strung or removed over roadways, there shall be traffic control.
518.2 “Catch Poles” shall be used when stringing or removing wire over express ways with moving traffic - one on each side and one in the middle median with protective barriers. If traffic is stopped during stringing and removing wire, catch poles are not needed.
518.3 When stringing or removing conductor(s) from the primary zone, precautions shall be taken to adequately insulate the worker by means of 20 kV rubber gloves and an insulated platform. The journey worker attending the reel shall be required to wear 20 kV rubber gloves and to keep all parts of the body free from contact with the conductor(s).
518.4 Non-insulated wire shall be pulled over a grounded roller and the truck shall be isolated or grounded to protect employees at ground level.
518.5 When stringing or removing wires crossing over lines energized at 600 volts or more, suitable guard structure or insulating equipment shall be installed at the point of crossing in order to eliminate possibility of accidental contact.
518.6 The automatic reclosing feature of the circuit-interrupting device shall be made inoperative when stringing or removing wire.
518.7 When required to string wire across any main road (four lanes or more) there will be a police officer or flagman posted at each direction of the work.
519 HYDROLIFT
519.1 With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated within 10 feet of any energized line or equipment unless one of the following conditions is met:
A. An insulated barrier is installed between the energized part and the mechanical equipment, or
B. The mechanical equipment is grounded, or
C. The mechanical equipment is insulated, or
D. The mechanical equipment is considered as energized.

520 HOISTING CABLES – CONDUCTIVE MATERIAL
520.1 Steel cables shall not be used to raise transformers, poles or any other material near energized lines, except when the cable and any other conductive materials being raised are adequately protected by insulating covering placed on such energized lines.

521 POLE HAULING AND SETTING
521.1 When setting or removing poles the Employee-in-Charge must ensure that the pole does not contact the energized conductor(s) and that all employees wear approved electrical protective equipment and utilize approved insulated devices. No employee shall make contact with the pole with any uninsulated part of his or her body.
521.2 Poles, ladders, pipe, etc. shall be loaded parallel with the truck length. Such material shall not extend beyond the normal sides of the vehicle.
521.3 All poles shall be securely fastened to prevent a hazard due to shifting.
521.4 Poles that extend more than four feet beyond the front or back of the truck or trailer shall have warning devices attached. During the day, red or orange flags shall be used; at night and during periods of poor visibility, amber lights shall be used.
521.5 When a vehicle is hauling long poles, escort vehicles displaying suitable warning signs shall be used.
521.6 If it becomes necessary to store poles at the locations where they will be set, they shall be so placed that they will not interfere with traffic. If poles are left on or near a street, highway, or walkway overnight, and have the potential to create a hazard, they shall be safe guarded by well-lighted warning signs.
521.7 Poles shall be so placed or blocked that they will not roll.
521.8 Poles loaded on a truck or trailer shall be securely fastened in at least two places.
521.9 The wheels of the transporting vehicle shall be blocked or securely braked prior to loading or unloading.
521.10 If any pole holes are left unfilled at the end of the work period, they shall be protected with substantial coverings.
521.11 Pole holes must be attended or physically guarded to prevent employees or the public from falling into the hole.
521.12 Only employees who are trained and qualified shall operate the pole setting equipment.

522 STREET LIGHTING CIRCUITS
522.1 Circuit shall be disconnected from source of supply by opening and physically rendering inoperative disconnecting switches, or cutouts. Proper Clearance
tags shall be attached. Dependence shall not be placed on time switches or other automatic devices.

551 WORKING ON ENERGIZED CABLE AND EQUIPMENT
551.1 Only qualified employees shall be assigned to work on underground conductors or equipment energized in excess of 50 volts. Apprentices in training who are qualified by experience and training shall be permitted to work on underground conductors or electrical equipment energized in excess of 50 volts while under the continuous supervision of a qualified employee. During the time the work is being done on any exposed parts or equipment energized in excess of 50 volts, two qualified employees shall be present at each work location.

551.2 Cable and equipment to be worked upon shall be positively identified, tested in an approved manner, and where required, a Clearance shall be obtained from BESOC in the prescribed manner.

552 WORKING ON DE-ENERGIZED CABLE AND EQUIPMENT
552.1 Before proceeding with the work, all primary conductors shall be tested for potential, short circuited and grounded at all ends whenever possible and at all locations, whether in a vault, substation, adjacent transformers or where the underground cable connects with the overhead system.

552.2 All switches or jumpers, through which it is possible to energize the cable to be worked upon, shall be opened and tagged. Where locking facilities and air Clearances are available, they shall be used.

553 WORKING AROUND CABLE IN VAULTS AND MANHOLES
553.1 Cables energized at more than 600 volts shall not be moved in such a manner as to form a bend or materially change the radius of any bend. Slight changes in position of the cable may be made that shall not endanger the sheath or insulation.

553.2 Employees shall never step on energized cables.

553.3 After completing cable work, the cable shall be properly tagged.

554 CHIPPING DUCT
554.1 When chipping concrete around duct containing cables, there shall be at least two journey workers or one journey worker and a qualified apprentice at the work location.

554.2 Before powered chipping tools are used to remove the concrete casing from around a duct containing energized cables, the cable shall be de-energized. This shall include all ducts containing energized cables adjacent to the duct to be exposed.

555 JUNCTION BOXES
555.1 Junction boxes with exposed air brake blades shall not be operated to drop load.

556 CABLE AND REEL HANDLING
556.1 If necessary to leave a cable reel or a trailer unattended the reel or trailer wheels shall be chocked on both sides.

556.2 Employees shall not remain in vaults or manholes during heavy pulling strains on cables.
557 **DIRECT BURIED CABLE:** Electric Cable which is specially designed to be buried under the ground without any kind of extra covering, sheathing or piping to protect it.

557.1 When digging in the vicinity of electric underground facilities a qualified employee shall be contacted to locate and mark facilities. If available maps do not give precise locations, suitable instruments shall be used to determine their location.

557.2 All underground electric cable shall be considered energized and shall be respected as such.

557.3 Neither pneumatic tools nor metallic probes shall be used when within three feet of underground facilities energized at over 600 volts. Further excavation shall be performed with proper hand tools.

557.4 Before beginning work, carefully observe for the presence of underground facilities such as gas meters, regulator vent guards, cables running down a pole or building into the ground, underground electric service, lack of overhead wires, electric service pedestals, telephone pedestals, yard lights, street lighting, line or cable markers, transformer pads, old or new ditch lines, valve boxes, etc.

558 **CABLE OR EQUIPMENT FAILURE**

558.1 When a fault condition exists, all buried cables operating at 600 volts and above located within three feet of the faulted cable shall be de-energized before digging. The cables not being worked on may be re-energized if not exposed in the excavation or after exposed cables are in satisfactory operating condition and properly protected to provide safe working conditions for personnel.

558.2 De-energized direct buried cable normally operating at 600 volts and above, shall be protected with proper hold-offs and grounded before cutting into them.

558.3 Splices performed on a URD cable requiring the use of a torch may not be used within a three feet vicinity of a natural gas line. Exposed natural gas lines between three feet and six feet from the proposed splice shall first be covered with:

- A. A minimum of six inches of dirt, or
- B. A rated flame-proof blanket.

558.4 Non-heat shrink splices shall be utilized when cables cannot be rerouted to obtain the minimum three feet clearance.

559 **UNDERGROUND EQUIPMENT AND URD CABLE**

559.1 Non-load break terminations (bayonets, etc.) shall never be used to make or break load. Conductors or transformers shall be energized, de-energized or sectionalized by opening or closing the closest rated load break device.

559.2 Energized load break elbows or other cable disconnecting type termination shall be handled only with approved insulating hot line tools. Energized load break elbows or other types of disconnecting terminations shall never be removed or installed with the gloved hand only.

559.3 Only approved accessories and devices shall be used to test and ground cables, transformers, or other underground equipment. All equipment and transformers shall be considered energized until grounded.
559.4 All underground equipment shall be tested and proven to be de-energized before grounds are installed.

559.5 Proper procedure for URD fault locating shall be followed.

559.6 All test equipment shall be removed from all equipment and/or cables under test before any switching can be done.

560 PAD-MOUNT TRANSFORMERS

560.1 Rubber glove work on pad-mount transformers shall be limited to secondary voltages up to and including 600 volts.

560.2 When switching or phasing leads energized at 600 volts and above in pad-mount electrical equipment, there shall be two journeymen or one journeymen and a qualified apprentice at the location of the electrical equipment.

560.3 It is required to physically check out the loop or it is required to phase primary before tying together in loop feed transformers.

560.4 Because of the inherent capacitance of underground cable after being energized at high voltage, an electrical charge may be stored in the cable until it is grounded. Note: If a de-energized cable is lying next to an energized cable, the de-energized cable will pick up an induced voltage charge. All cable terminations and transformer shall be grounded before touching them.

575 ELECTRIC METERING AND EQUIPMENT

575.1 Because of the high fault currents available in this equipment, only qualified and properly trained employees shall work on meters and meter equipment.

A. Rubber gloves, arc-rated face shield/Class E Type I or II hard hat with eye protection, and arc-rated clothing shall be worn when installing or removing meters from energized meter sockets. Leather gloves may be worn if socket is de-energized.

B. Meter sockets shall be inspected before the meter is installed and/or the service is energized. Checks shall be made to ensure there is not socket damage, loose connections, or foreign objects present that could cause a short circuit or flashover.

C. Voltage readings between the source, load, and ground shall be made to identify cross-phasing, backfeed, or phase-to-ground fault present in the meter socket.

D. Single-phase and three-phase meters installed in meter bases with bypass capabilities shall be disconnected or connected using one of the following methods:
   1. By using the facility main switch or disconnect installed before the meter.
   2. By disconnecting the service or de-energizing the transformer location.
   3. Metering Specialist may use bypass handle with source energized to change out meters only.

E. Before removing a meter, a visual inspection shall be made to determine if the meter or meter socket is damaged. If damage is indicated, the meter shall be de-energized before removal.

F. When setting socket-type meters, the load side terminal shall be entered first, followed by the source side. The removal of the meter shall take place in the reverse order. Care shall be taken to prevent the meter ring from coming into contact with the socket terminals.
G. Meters shall not be disconnected by rotating the meter in the meter socket.
H. During testing, the energized socket or test equipment shall not be left unguarded. If a socket is to be left energized, a meter or approved socket cover shall be in place before leaving the work area.
I. Only qualified, trained employees shall perform installation, removal, and maintenance of transformer-rated meters.
J. Under no circumstances shall the secondary terminals of a current transformer be opened. The transformer shall be shunted before the secondary metering circuit is opened.
K. A check shall be made to ensure that all instrument transformer cases and associated enclosures are properly grounded.
L. When approaching or working on customer property, employees shall watch for tripping hazards, defective stairs, and the presence of dogs, cats, or other potentially dangerous animals.
M. Before entering customer property, employees shall announce their presence and state their business if practical. Employees shall also notify the customer when leaving the property if practical.
N. If possible, employees shall turn off customer main switch prior to installing and removing socket-type meters.
O. Employees shall push socket-type meters into their socket. Employees shall never hit the meter with their hand or any other device.
P. When metering equipment shows evidence of lightning, fire, vandalism, or other significant damage the service shall be de-energized before any work is performed.
Q. Non-conductive tools shall be used to avoid contact between live parts and the ground.

575.2 Required personal protective equipment for electric meter work.
A. ANSI Z87.1 safety glasses or goggles.
B. ANSI Z89.1 Class E Type I or II hard hat with arc-rated face shield with chin cup.
C. Class "0" rubber gloves with leather protectors when working on equipment up to 600 volts.
D. Class "2" gloves with leather protectors and sleeves when working on equipment above 600 volts.
E. Arc-rated clothing.

575.3 Prior to performing any work on the secondary side of an energized current transformer, inspect all test equipment leads to ensure all connections are secure.

575.4 Never open the secondary circuit of a CURRENT transformer while the primary winding is energized. If it is necessary to disconnect instruments on wiring, first short circuit the secondary winding at the current transformer or at a terminal block provided for the purpose.

575.5 Never short-circuit the secondary circuit of energized instrument VOLTAGE transformers.

575.6 Always wear eye protection and appropriate gloves when stripping broken glass from meters.

575.7 Due to the hazard of flying glass, never intentionally break or attempt to chip away broken glass covers. Carefully disassemble the glass using proper personal protective equipment.
Pick-up and properly dispose of all broken glass. Never leave broken glass at a customer’s premises, or in an inappropriate area.

**ENGINEERING GENERAL RESPONSIBILITY**

**590.1** All engineering process areas shall follow required BWL safety rules when in the office and in the field.

A. When approaching or working on customers’ property, employees shall watch for tripping hazards, defective stairs, and the presence of potentially dangerous animals or any other hazards.

B. Before entering customer property, employees shall notify the customer of their presence and state their business. They shall notify the customer when leaving.

C. Employee shall wear an approved bright colored safety vest and required personal protective equipment when working within 15 feet of the edge on any roadway or driveway.

D. Use one or more assistants when measuring across roadways with traffic that will interfere with measuring by one person alone. This includes measuring the height of facilities overhanging the roadway. Assistants may watch for developing hazards or help measure, whichever is safer.

E. Use a measuring wheel, non-metallic folding rule or cloth tape for general measuring. Do not measure with a hand-held measuring wheel from a moving vehicle.

F. Steel measuring tapes shall be used for line surveying only when there is no risk of contact with energized conductors.

G. Employees shall not probe in areas where direct buried cables are located.

H. Only trained qualified employees shall use a fiberglass measuring stick to measure the height of any overhead equipment. The fiberglass measuring stick shall:
   1. Be inspected before each usage.
   2. Be cleaned as needed but not less than once a year.
   3. Last inspect date shall be attached to stick.

I. Employees working alone in isolated area shall notify the Employee-in-Charge of their intended location and scheduled route or location and/or maintain radio contact with another approved employee.

**590.2** Underground distribution work area.

A. Employee shall request from the electric emergency worker or distribution process area assistance to open enclosure, transformer or any other energized equipment.

B. Employee shall be properly trained and qualified before entering any excavation more than four feet deep.

C. Only qualified trained employee shall enter manholes, vaults, or enclosed spaces and they must follow BWL confined space rules in Section 150 and request assistance from the distribution process area.

D. Employees shall wear approved required personal protective equipment.

E. Employees shall not make contact with any exposed energized equipment.

**590.3** Electric Substations.

A. Only qualified trained employees shall enter any substation or substation yard. Non-qualified employees shall only enter these areas with a qualified employee.
B. Non-qualified employees shall keep all equipment and themselves a minimum of:
   1. 10 feet away from conductors and equipment in 15 kV substations, and
   2. 13 feet away from conductor and equipment in 138 kV yards and substations.
C. Employee shall wear approved required clothing. See Section 208 – Clothing.
## SECTION 600
WATER TRANSMISSION AND DISTRIBUTION SYSTEM

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600  **EMPLOYEE RESPONSIBILITY**

600.1 If an employee is called upon to perform work that could be considered hazardous, and proper protection is not provided, the matter shall be brought to the attention of the Employee-in-Charge before starting work.

600.2 Before starting a job, satisfy yourself that you can perform the task without injury.

600.3 Do not operate tools or equipment without proper safety training.

600.4 Inspect all protective equipment, tools, and devices for damage or defect before using.

600.5 Whenever necessary for safe job performance, ask the Employee-in-Charge to explain any safety rule, practice or procedure.

600.6 If you must work or inspect premises alone, follow the Water and Steam Distribution Department’s specific safety procedures. See Section 110 – Customer Premises.

600.7 Review Section 102 of this manual.

601  **PERSONAL SAFETY**

601.1 Whenever confronted with a threat of bodily harm, the threatened employee shall withdraw from the situation as quickly as possible without rebuttal or remarks and immediately notify the Employee-in-Charge.

601.2 Employees shall be trained and qualified in First Aid and CPR.

601.3 Employees shall know the locations of the First Aid and CPR kits.

601.4 The locations of First Aid and CPR kits shall be marked on all vehicles.

601.5 Obtain assistance when lifting heavy, awkward objects and use proper lifting techniques.

601.6 Loose fitting clothing, dangling jewelry, rings and ties may cause serious injury to employees operating and working around power driven equipment and shall not be worn.

601.7 Employees shall know where to locate MSDS files.

601.8 Employees shall wear their personal protective equipment as determined by the task being performed. Review Section 200 of this manual.

601.9 The paper mask respirators can only be used for dust control, not as an approved respirator.

601.10 When various types of respirators are available, care must be taken in proper selection. The respirator must provide adequate protection against the anticipated hazard.

601.11 Lockout/Tagout - Refer to process area procedures.

602  **HOUSE KEEPING**

See Section 111 – Housekeeping

603  **FIRE PROTECTION**

See Section 105 – Fire Protection and Prevention

604  **CONFINED SPACE**

See Section 151 – Confined Spaces

605  **WORKING AROUND UTILITIES**

See Section 155 – Working Around Underground Utilities
EXCAVATION AND SHORING
See Section 116 – Excavation, Boring, and Tunneling

DISTRIBUTION INSTALLATION AND REPAIRS

Mains.
A. Traffic control shall be your first consideration.
   - See Section 350 – Traffic Control
   - See Section 351 – Barricading and Flagging
   - See Section 352 – Vests
   - See Section 353 – Traffic Regulators
B. Before locating a leak, ensure MISS DIG has marked all utilities.
C. Whenever working in excavations exceeding four feet in depth or where unfavorable soil conditions exist, shore, slope, or taper the banks. Shore unstable soil.
D. When using tools, proper personal protection shall be used.
E. Make sure air hoses are equipped with check valves and safety cables.

Hydrants.
A. When lifting or lowering a hydrant, use proper rigging techniques.
B. When lifting or lowering a hydrant, workers shall keep a safe distance from the hydrant.
C. When using a Seat Wrench, utilize safe lifting practices.
D. Don’t stand in front or the nozzle when pressurizing a hydrant.

Lead Pots/Steam Pots.
A. Warning: Lead substitutes do exist in distribution system when heated materials do not melt but may splatter.
B. When using propane tanks, check tanks for leaks.
C. When transporting propane tanks, disassemble and secure tanks.
D. When preparing lead for melting, insure that there is no water mixed with the lead.
E. When handling molten lead, a full-face shield, leather gloves, leather apron or fire resistant coveralls shall be used.
F. Inspect steam pots, hoses, and spouts before using.

SERVICES

When using the Bore Machine, the operator shall stand behind or to the right of the machine.
Hoses shall not be used for lowering or lifting the Bore Machine in or out of the hole.
When digging a bore pit, proper excavation procedures will be followed.
Dangling sleeves or loose fitting ends shall not be permitted when working on or near machine tools, moving or rotating equipment. Close fitting or guarded clothing shall be worn.
When flaring copper, use a brass hammer.
Only properly trained and licensed employees shall operate the Ramset.
When hoses cross a street they must be secured.
Care shall be taken to protect skin when handling Dry Ice. Proper gloves shall be worn.
Any time a water meter is removed, a jumper cable shall be attached prior to removing the meter to assure that a continuous ground is maintained.
609     EQUIPMENT/CRANES/VEHICLES
609.1 Operators License – No employee shall operate a BWL vehicle without a valid operators license or, when necessary, a CDL (Commercial Drivers License) endorsement for qualifying vehicles and equipment in their possession.
609.2 If vehicle is unattended, engines shall be turned off, ignition locked, keys removed, vehicle put in gear or park and emergency brake set. Exceptions shall be permitted when auxiliary equipment is needed, such as operating emergency equipment, radios, or diesel engines. On hills or inclines, wheel chocks shall be used.
609.3 Operators shall comply with manufacturer’s operating instructions.
609.4 Operators shall comply with local, state, and federal regulations.
609.5 All items in the truck cab or bed shall be secured for unanticipated shifting or movement due to turns, fast stops, acceleration, etc.
609.6 Safety seat belt and shoulder harnesses, where provided, shall be worn by drivers and passengers.
609.7 An operator who is receiving hand signals shall stop work immediately if signals are unclear.
609.8 Before operating a BWL vehicle or equipment, each driver or operator shall make sure, in so far as it can determined, that the vehicle or equipment is in proper operating condition. Refer to the BWL’s Drivers Responsibility decal posted in the vehicle. Any unsafe condition shall be reported to the Employee-in-Charge and Fleet Services for correction. Vehicles with steering and brake defects shall not be driven.
609.9 The operator shall inspect all controls, brakes, supports, etc. at the beginning of each work interval. All load and lifting limits shall be posted and shall never be removed from the equipment. They shall make sure all loads are properly secured.
609.10 Proper personal protective equipment must be worn when working on or around equipment.
609.11 All doors and guards shall be in place when equipment is in service.
609.12 The operators of a crane or hoist shall stop on signal from anyone, but normally shall accept signals from the person in charge of lifting operations.
609.13 People shall never walk between a fixed object and moving equipment.
609.14 Employee shall never ride on loads or hooks. Stay clear of moving loads and never stand or walk under suspended or moving loads, cables, and hooks.
609.15 Hooks shall be snubbed with wire or shackles, to avoid danger from a load being suddenly released, and when the chain hoist is suspended from a long cable. When required by the Employee-in-Charge, tag lines shall be use to control lifted and moving loads.
609.16 When working around Loadals, Backhoes, Excavators, and Loaders, stand clear of pinch points.
609.17 When operating vehicles and equipment, seat belts will be worn.
609.18 Vehicles equipped with P.T.O. (Power Take Off) shall not be transported with P.T.O. engaged.
609.19 Employees shall not ride on or in trailers.
609.20 Trailer warning signals shall be tested prior to transporting to ensure they are in working condition.
609.21 Employees shall be careful to keep hands and body parts away from pinch points when hitching or unhitching a trailer.
609.22 See also Section 300 – Vehicle Operation
See also Section 301 – Seat Belts and Shoulder Harnesses
See also Section 303 – Inspections of Vehicle Equipment
See also Section 304 – Transporting Employees
See also Section 305 – Parking
See also Section 306 – Backing
See also Section 307 – Stopping on Highways
See also Section 309 – Equipment Fueling
See also Section 313 – Crane, Hoist, Derrick

610 BARRICADING AND FLAGGING
See Section 351 – Barricading and Flagging
See Section 352 – Vests
See Section 353 – Traffic Regulators

611 RIGGING
See Section 314 – Rigging

612 TOOLS
612.1 All tools and equipment shall be inspected daily prior to their use.
612.2 Defective tools and equipment shall be tagged for repair and removed from the job site.
612.3 Hand Tools.
A. Tools not covered in these rules shall be used in accordance with manufacturer’s recommendations. See Section 400 – Tools and Equipment.
B. Proper personal protective equipment shall be worn when using tools.
C. Use a brass hammer when flaring copper.
D. Tools shall not be thrown from one place to the other or from person to person. Tools that must be raised or lowered from one elevation to another shall be placed in tool buckets or firmly attached to hand lines.
E. If chisels, punches, flaring tools, etc. become mushroomed or cracked, they shall be dressed, repaired or replaced before further use.
F. Wooden handles that are loose, cracked or splintered shall be replaced.
G. Tools shall never be placed unsecured in elevated places.
H. Tools shall not be left lying around where they could cause a person to stumble or trip.
612.4 Fuel Powered Tools and Equipment.
A. Do not start within 10 feet of fuel supply.
B. Do not run when refueling. Never leave energized tools running.
C. No smoking or open flames while refueling.
D. Ensure that all other persons are in the clear when the saw is being started or operated.
E. Cracked, dull, or damaged blades shall not be used. Never drop start a power saw.
F. Idle adjustments shall be made so that the chain or blade comes to a complete stop when the trigger or throttle is released.
G. When in use, the operator is to maintain two-hand control of gas saw.
H. If fuel is spilled on equipment, be sure that spilled fuel is completely cleaned up, evaporated or free from ignition before starting equipment.
I. All fuels shall be stored in approved, labeled containers.
J. Fuel containers shall be inspected prior to use and replaced if needed.
612.5 Pneumatic Tools/Compressed Air.
See Section 416 – Pneumatic Tools
See Section 420 – Compressed Air

612.6 Powder-Actuated Tool.
See Section 411 – Powder-Actuated Tools

612.7 Electric Tools.
A. A ground fault interrupter device (GFI) shall be used when using electric tools.
B. Vehicles equipped with generators shall have GFI. Electric tools and extension cords shall be grounded and approved by a nationally recognized testing institution.
C. Electric tools shall not be used in an atmosphere where combustible vapors, gases, or dusts exist (unless labeled explosion proofed).
D. The guard shall not be tied back or removed except for servicing.

612.8 Power Pony.
A. Valve Turning.
   1. Only trained and qualified employees shall operate.
   2. Do not wear loose fitting clothing when operating.
B. Minimum of two persons shall operate.

613 DISINFECTING WATER MAINS
613.1 Only trained and qualified personal shall disinfect mains or other related equipment.
613.2 Approved protective equipment and clothing shall be worn whenever disinfectants may spill, splash, fly, or drip upon the person handling them. Refer to MSDS.
613.3 Store and clearly label chemicals and solvents in containers to identify the contents.
613.4 When transporting, chemicals shall be in approved containers and secured to prevent spillage.

614 TORCHES
See Section 418 – Welding, Cutting, and Brazing

615 COMPRESSED GASES
See Section 419 – Compressed Gases
SECTION 700
WATER PRODUCTION

700  Operations
701  Water Well and Water Main Disinfection

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700 GENERAL WATER PRODUCTION OPERATIONS

700.1 Basin Area.
   A. Ground fault protection devices are required when using any electrical
equipment in the basin area.
   B. No unapproved oil, paint, solvents, or chemical materials are allowed in
the basin area.

700.2 Filter Press Operation.
   A. Do not enter the Filter Press truck bay loading area when the red warning
lights are flashing.
   B. Use proper care of contaminants in and around basin area. Keep
walkways clear of foreign objects and materials.

700.3 Valve Turning (Isolating Lines).
   A. Only approved valve-turning equipment shall be used.

700.4 Telemetry and Remote Operating Equipment.
   A. Equipment that can be remotely started shall be identified and signs
posted.

701 WATER WELL AND WATER MAIN DISINFECTION

701.1 BWL Water Transmission and Distribution and Water Production
Departments shall maintain procedures and conduct employee training
consistent with the most current version of AWWA Standard C652-99 for
employees responsible for water main, wells, valves, and equipment
disinfection.

701.2 Liquefied compressed chlorine gas shall not be used for water main
disinfection.

701.3 Only approved bleach solutions and sodium hypochlorite tablets shall be used
for water main disinfection.

701.4 Sodium hypochlorite tablets shall not be used in piping where the worker
must enter the water main. Toxic fumes may be created when the tablets are
exposed to moist air.
SECTION 800
LOCKOUT/TAGOUT AND CLEARANCES

800 General
801 New or Replacement Equipment
854 Dispatching and Switching
855 Operating Switches and Devices
856 Emergency Switching
857 Testing
858 Switching Orders
859Grounding

DEFINITIONS

Clearance – A process or procedure to control hazardous energy sources (electrical, mechanical, chemical, pressure, thermal, pneumatic, gravity, hydraulic) on machines, equipment, electrical circuits, or systems using a system of locks, tags and communication for the purpose of employee safety and protection.

Affected Employee – An employee whose job requires operating, using, or working in the area where servicing or maintenance is being performed on any machine, equipment, electrical circuit or system under Lockout/Tagout.

Authorized Employee – A person who applies the locks or tags on machines, equipment, electrical circuit or systems to be serviced.
800  GENERAL
800.1 Lansing Board of Water and Light (BWL) shall maintain a Lockout/Tagout Program. The program shall include Clearance and energy control procedures, training requirements, and program inspections.

800.2 BWL Lockout/Tagout and Clearance procedures apply to all BWL employees and contractors.
A. Under no circumstances shall an unauthorized person attempt to start, energize or use a machine, equipment or circuit that has been locked or tagged out.
B. Employees shall consult with supervision/management whenever there are any questions regarding energy control procedures or methods.
C. Outside contractors shall submit Lockout/Tagout requests through the BWL process area coordinating the contractor work.

800.3 Failure to follow any Lockout/Tagout rule or procedure is a violation of the BWL Safety Rules and employees are subject to disciplinary action.

800.4 Before employees perform any servicing or maintenance on a machine, equipment, or circuit where the unexpected energizing, startup or release of stored energy could occur, the machine, equipment or circuit shall be isolated from the energy source and rendered inoperative.

800.5 Each department or facility shall identify a single person or position per shift that is responsible for the Lockout/Tagout program for the purpose of reviewing and processing all Clearance requests.

800.6 Each piece or combination of equipment, machines or circuits shall have specific Lockout/Tagout procedures which include:
A. Procedural steps for shutting down, isolating, blocking and securing the equipment.
B. Specific steps for placement, removal and transfer of locks or tags.
C. Specific requirements for testing to determine and verify the effectiveness of the locks or tags.
D. Specific steps for returning the equipment, machine or circuit back into service.

800.7 Employee Training.
A. Authorized employees shall receive training in the recognition and control of hazardous energy sources and the methods and procedures for hazardous energy control.
B. Affected employees shall receive training in the purpose and use of energy control procedures.
C. Employees shall be retrained whenever there is a change in assignment, equipment or procedures, or whenever periodic inspections identify deviations or inadequacies in the use of energy control procedures.

800.8 Lockout/Tagout devices:
A. Shall be uniquely identifiable and shall not be used for any other purpose.
B. Shall be standardized within the facility or department.
C. Shall clearly identify the authorized employee requesting the Clearance.
D. Shall be selected to withstand the environment which they will be exposed for the expected work duration.

800.9 Tagout Device.
A. When a Lockout device cannot be used a Tagout device shall be used.
B. Tagout procedures shall provide the equivalent level of safety as a Lockout device.
C. Tagout devices shall be attached at the same location that a Lockout device would have been attached.

**800.10** Prior to starting work on equipment or an electrical system that has been locked or tagged out the authorized employee shall verify (i.e., test start) that the isolation and de-energization has been accomplished.

**800.11** Release from Lockout or Tagout.
A. Each department or facility shall identify a single authorized person or position per shift that is responsible for the Lockout/Tagout program for the purpose of releasing a Clearance and returning equipment to service.
B. Only an authorized employee shall remove locks or tags.
C. The work area shall be inspected to ensure that the equipment components are operationally intact, and all employees and material have been removed from the area.
D. If applicable, all personal protective grounds shall be removed.
E. From this point forward the system should be considered energized.
F. All affected employees shall be notified that the Lockout/Tagout devices have been removed or are about to be removed.
G. If the authorized employee who requested the Lockout/Tagout devices is not available, procedures shall be followed for the device to be removed under direction of the department/process management.

**800.12** Temporary Removal of Lockout/Tagout devices.
A. Lockout/Tagout devices may be removed for energizing for temporary testing or positioning of equipment following all criteria in Rule 800.11.
B. Immediately after testing, all Lockout/Tagout devices shall be reapplied.

**800.13** Group Lockout/Tagout.
A. When multiple work groups are working on the same equipment an authorized employee shall be designated to coordinate affected work groups.
B. The authorized employee shall follow a procedure which provides an equivalent level of safety as a personal Lockout/Tagout device.

**800.14** Shift or Personnel Changes.
A. The authorized employee shall ensure that procedures are in place to provide an orderly transfer of Lockout/Tagout protection between off-going and oncoming shift employees.

**801** NEW OR REPLACEMENT EQUIPMENT

**801.1** Whenever replacement, major repair, renovation, or modification of a machine or equipment is performed the equipment shall be designed to accept a Lockout device.

**801.2** Before any new, replacement or modified equipment is put into service the Project Coordinator or System Operations shall verify that a Clearance procedure is in place and/or initiate the necessary changes to the Clearance procedure.

**854** DISPATCHING AND SWITCHING

**854.1** Jurisdiction – All high voltage lines and equipment in the BWL transmission and distribution system shall be under the jurisdiction of the Electric System Operator (ESO).
Generators and house service electrical systems in the power plants are under the jurisdictions of the Power Plant Employee-in-Charge.

854.2 Requests – All requests for Clearances within the BWL transmission and distribution system shall be made to the Electric System Operator.
A. All procedures necessary to provide safe Clearances shall be ordered in accordance with the BWL LOTO procedure.
B. The Electric System Operator shall issue orders for switching, placing or removing protective tags and padlocks, and for the removal or replacement of high voltage lines or equipment in service.

854.3 Notification – Employees entering any substation, vault, or manhole shall make their presence known to the Electric System Operator. The Electric System Operator shall notify all personnel in the area before switching begins.

854.4 Records – The Electric System Operator shall keep clear and complete records of all transmission and distribution switching and Clearances. This includes the equipment name, switch and circuit designations, and all locations of grounds and tags.

854.5 Grounds – Clearances shall not include grounding unless the person requesting Clearance specifically asks for it.
A. Clearance or switching procedures shall not relieve the necessity for installing personal protective grounds.
B. Personal Protective Grounds shall be reported to the Electric System Operator ONLY if left unattended.

854.6 Responsibility – It shall be the responsibility of the Employee-in-Charge of the work to make sure all employees are made aware of and have acknowledged the instructions or orders relative to the condition of Clearance of lines or equipment before work is started. All employees involved shall be advised of any changes in the condition or status of the lines or equipment.

855 OPERATING SWITCHES AND DEVICES
855.1 Authority – No switches shall be operated without first securing approval and/or field control from the Electric System Operator.

856 EMERGENCY SWITCHING
856.1 In case of emergency, switches or devices may be operated without authorization from the Electric System Operator; however, the operator shall be notified as soon as possible.

857 TESTING
857.1 Before starting work, de-energized lines shall be checked for potential in accordance with BWL procedures.

858 SWITCHING ORDERS
858.1 Written – All communications concerning operation of switches or devices within the BWL transmission and distribution system shall be scheduled in advance and in writing whenever possible.
Verbal – Verbal orders shall be repeated back by the receiver to avoid misunderstanding. The names of the sender and receiver of such orders shall be documented.
858.2 Modifications – Discussion shall be held with all authorized and affected employees.
   A. All authorized and affected employees must understand and agree to the switching order changes.
   B. The authorized employee shall document changes on the original written switching order and include date, time, and initials of the authorized employee.

859 GROUNDING

859.1 Protective grounds - Protective grounds shall be applied before working on de-energized lines and equipment.

859.2 No protective grounds - If protective grounds cannot be applied, then lines and equipment shall be treated as energized.

859.3 Recording grounds.
   A. Requested Grounds.
      When protective grounds are requested as part of the Clearance, a record of each ground applied shall be kept by the Electric System Operator so that all grounds can be removed prior to returning equipment to service.
   B. Personal Protective Grounds.
      Grounds installed by workers for personal protection shall be reported to and recorded by the Electric System Operator when left unattended.

859.4 Testing - Protective grounds shall not be applied until the line or equipment has been determined to be de-energized.

859.5 Procedure - Suitable grounding devices shall be used. They shall be first connected to a ground before being brought in contact with any de-energized conductor of the circuit to be grounded. When removed, they shall be removed from all circuits' conductors before being disconnected from the ground. Grounds shall be so placed that one of them is readily visible to at least one member of the crew where possible.

859.6 The station’s source shall be grounded first for initial Clearance and station grounds removed last before restoration. Changing of grounding points during the Clearance shall be by field direction with BESOC’s approval. Exception: in some rare occasions, grounds will be installed back to source first to allow removal of protective covers from grounding points.

859.7 Protective equipment - Proper personal protective equipment deemed necessary by Employee-in-Charge shall be used when applying and removing protective grounds.

859.8 Cable size - Only cables and conductors designed for the purpose shall be used for protective grounding.

859.9 Minimum copper conductor size for ground cables:
   138 kV - 2/0
   Distribution Primary - 2/0
   Distribution URD Elbow Grounds – 1/0
   Lead Underground (U.G.) - 2/0
   Overhead - 2/0

859.10 Placement.
See Section 552 – Working on De-energized Lines and Equipment
This section of the Safety Manual pertains to safety requirements applicable to electric, steam and chilled water production facilities. However, other sections of this manual are common to all employees and production employees are expected to be familiar with the requirements and follow all rules applicable to their work assignment. At individual facilities where specific safety instructions are required, these instructions shall be provided to all employees and visitors.
900 GENERAL

900.1 Equipment shall be considered in service unless properly cleared and locked or tagged out.

900.2 Equipment Identification.
   A. Each facility shall establish a uniform and consistent equipment identification system.
   B. Employees shall use the facility identification system to identify equipment for operation or maintenance activities.

900.3 Housekeeping.
   A. Coal dust and fly ash shall be removed from pipes, beams, equipment, etc at regular intervals and in such a way not to cause a hazardous condition.
   B. Compressed air is not allowed for cleaning coal dust or fly ash.

900.4 Where explosion proof lighting is required it shall not be replaced with conventional fixtures.

900.5 All elevated work platforms shall have adequate and secure railings.

901 DAMS, COOLING TOWERS AND PONDS

901.1 Life lines shall be placed and maintained on or near cooling towers, discharge platforms, outfalls, and river or pond docks and platforms.

901.2 Life jackets shall be worn when walking or working on the Eckert cooling tower discharge and boom floats.

901.3 Employees shall be secured with a safety harness and lanyard when working on, inspecting, or cleaning dam trash racks.

901.4 The Moores Park Dam pond level shall be dropped below the crest of the dam when working on the upstream face of the dam.

902 BOILERS

902.1 Face shields shall be worn when checking boiler furnace openings.

902.2 Indirect vented goggles shall be worn when working inside boilers.

903 ASH SYSTEMS

903.1 Indirect vented goggles shall be worn when working on or inside boilers, precipitators, ash silos or hoppers, ash transport lines or pumps.

903.2 Unless clean and washed down, respiratory protection shall be worn when working on or inside boilers, precipitators, ash silos or hoppers, ash transport lines or pumps.

903.3 When cleaning or emptying ash silos, hoppers, or equipment the ash must be controlled so that there is no uncontrolled environmental release or employee exposure.

904 CHILLED WATER PLANT

904.1 In the event of a refrigerant alarm evacuate the building immediately and contact the Employee-in-Charge.

904.2 Only SCBA-trained employees may enter the building to investigate a refrigerant alarm or repair an active leak.

905 GENERAL COAL HANDLING AND RAILCAR OPERATION

905.1 Employees Shall Not:
   A. Ride in cars, on couplings, on the ladder between, or on the footboard of the locomotive.
   B. Cross in front or back of the cars or locomotive unless it is safe to do so.
C. Climb over the top of cars,
D. Work or crawl under a car or locomotive unless the wheels are blocked in both directions and blue flags placed.
E. Enter a car if a cave-in is possible.
F. Use their feet to line up drawheads while switching or dumping cars.
G. Jump from one car to another while either is in motion.
H. Neither go between a car nor locomotive while it is in motion.

Carbon Monoxide Air Monitors.
A. Personal air monitors shall be worn whenever employees enter the following areas: Erickson reclaim hopper and coal feeder area, opening bunker doors and chute access doors, Eckert 2A and 2B feeder unloading pit, or Moores Park basement.
B. In the event of an air monitor alarm immediately leave the area and notify the Employee-in-Charge.

Carbon Monoxide Air Monitors.

Respiratory Protection.
A. Employees working in coal handling operations shall follow the requirements of the BWL Respiratory Protection Program.

Blue Flags.
A. The Employee-in-Charge or authorized contractor shall place blue flags at both ends of the track whenever there are track repairs, derailment, locomotive or car repairs, rail road request, derailer installation or any other situation where moving the rail cars creates a dangerous situation.
B. When a blue flag is in place, locomotives or rail cars shall not be moved into or inside the blue flag area.
C. The Employee-in-Charge shall immediately notify Canadian National Railway of a blue flag track.
D. Equipment or materials shall not be placed where they obstruct the visibility of the blue flags.
E. Only the Employee-in-Charge or person setting the flag shall remove blue flags.

COAL HANDLING COMMUNICATION
906.1 Employees shall have a working two-way radio and have it in service at all times.
906.2 When radio communication is not possible a Safety Watcher shall be assigned.
906.3 Erickson Station - Employees shall notify the A-Operator at the start and finish of coal pile grooming, equipment inspection or moving coal into the reclaim hopper.

LOCOMOTIVE OPERATION
907.1 Only authorized, trained employees shall operate locomotives or the locomotive remote control.
907.2 Locomotive warning bells and horn.
A. Before moving a locomotive, the operator shall sound the warning bell or horn.
B. The warning bell or horn shall be sounded when approaching a walk, a driveway, or entering or exiting thawing pit or thawing shed area.
907.3 Flying switches shall not be made.
907.4 Drawheads or knuckles shall not be shifted while locomotive or car is in motion.
907.5 When operating manually, the locomotive shall not be moved unless the operator has received radio communications Clearance by the switcher.
   A. Hand signals are not permitted.
   B. Repeat transmission before acting. If you are unsure, stop the train at once.

907.6 Erickson Station.
   A. When spotting cars, employees shall use the camera monitor to verify the end of the dumper is clear and all employees are in a visible safe location.
   B. Never move the train while coal is being unloaded until given an all clear signal from your partner.

908 COAL CAR UNLOADING
908.1 When walking across the unloading pit grating, the grating shall be covered with planking or similar stable walkway support material.

908.2 Eckert Station Coal Car Shaker.
   A. Hearing protection is required when cars are being unloaded.
   B. Daily, before using the shaker, inspect for worn cables, chains, belts, or cracks in the shaker structure.
   C. The coal car shall never be moved when the shaker is resting on it.
   D. The shaker shall never be left suspended in the air when not unloading coal.
   E. The shaker shall be stored on the ground away from the tracks when not in use.
   F. Employees shall not walk under or break up coal on the unloading grates while the shaker is suspended.
   G. The car shaker shall be locked out before an employee enters a coal car.

908.3 Erickson Station Coal Dumper.
   A. Cars shall be properly positioned for dumping.
   B. The dumper shall not be operated until the all clear signal is received from the opposite operator.
   C. Do not step onto the dumper table while it is in motion.
   D. Before entering the unloading pit, the employee shall lock out the dumper table and the coal crackers.
   E. A Safety Watcher shall be assigned while an employee is working, standing or walking on the unloading pit grating.

909 ECKERT STATION CAR HOES
909.1 Ground workers shall be aware of car hoes when they are in operation.
909.2 After starting the hydraulic system, operator shall visually inspect hydraulic hoses and wrist pins before starting daily work.
909.3 Operator shall wear a seat belt at all times when operating car hoes.
909.4 Operator shall be aware of ground workers when operating the car hoes.

910 COAL CONVEYORS AND CRUSHERS
910.1 Employees shall not ride conveyor belts.
910.2 Employees shall clean conveyor chutes or crusher from an established position outside the equipment.
910.3 Before cleaning a coal chute, all coal conveyers feeding the chute shall be shut down. An informational tag shall be placed on the controls in the control room.
910.4 The crusher shall be locked out before any interior cleaning or repair.
910.5 Unless water washing, employees shall not clean conveyor load rollers or counter weights while belt is operating.

910.6 Employees shall not crawl over or under a conveyor belt unless a Clearance is in place.

910.7 Employees shall face in the direction a belt is moving when shoveling coal from under conveyor or walkways onto the moving belt.

910.8 D- or T-handled shovels or cleaning devices shall not be used for moving coal onto the conveyor belt or cleaning.

911 COAL TRIPPER AND BUNKER ROOMS

911.1 Bunker inspection doors shall be closed at all times unless specifically opened for maintenance, cleaning, or fire fighting.

911.2 If the bunker doors are to be left open and unattended, barricades or warning devices shall be used.

911.3 Only automation or approved tools shall be used to move the tripper.

911.4 Pieces of wood or metal shall not be used as a brake on the tripper.

912 COAL BUNKERS

912.1 All coal bunkers are classified as Permit Required Confined Spaces.

912.2 Before entering a coal bunker, a Clearance shall be installed on the tripper and all coal feeder equipment.

912.3 Employees shall not enter a bunker if there is a bunker fire.

913 BIN WHIP

913.1 Two people are required to move the bin whip.
SECTION 1000
CHEMICAL AND BIOLOGICAL MATERIALS

1000 Hazard Communication (Right to Know)
1001 General
1002 Bloodborne Pathogens
1003 Chemical Material Storage
1004 Spill Response
1005 Chemical and Biological Waste Disposal
1006 Flammable and Combustible Materials
1007 Bulk Chemical Tanks, Piping and Storage
1008 Acids and Bases (caustic)
1009 Cleaning Materials
1010 Chlorine
1011 Pesticides
1012 Asbestos
1013 Fly Ash - Inorganic Arsenic
1014 Lead
1015 Silica

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HAZARD COMMUNICATION (RIGHT TO KNOW)

1000.1 BWL shall maintain a written Hazard Communication Program. The written program shall provide implementation procedures, workplace hazard identification, labeling requirements, Material Safety Data Sheet (MSDS) availability, and employee training.

1000.2 Employees shall receive Hazard Communication training during initial orientation or prior to work assignment.

1000.3 All employees shall be trained on the BWL written Hazard Communication Program.

1000.4 Material Safety Data Sheets (MSDS).
   A. MSDS location and new materials signs shall be posted in each facility.
   B. A MSDS shall be received before any chemical material can be used. This includes materials used on a “trial” basis or samples.
   C. All responsibility areas shall ensure that MSDS are available to employees during their work shift.

GENERAL

1001.1 Refer to the Material Safety Data Sheet (MSDS) for chemical hazard information prior to using any chemical material.

1001.2 All chemical material spills or releases to the environment shall be immediately reported to the Employee-in-Charge.

1001.3 Personal Protective Equipment.
   B. Personal protective equipment shall be used according to the MSDS recommendations.
   C. Safety glasses alone are not approved for chemical use.
   D. Use chemical safety goggles or a full face shield when handling chemical materials.
   E. Most leather materials cannot be decontaminated and shall be disposed of. Contact the manufacturer for cleaning procedures for any contaminated leather gloves, tools, or equipment.

1001.4 First Aid and Medical Treatment.
   A. Immediately report all chemical or biological exposure or injury to the Employee-in-Charge.
   B. Refer to the MSDS for first aid recommendations.
   C. Respiratory or eye exposure may require immediate medical attention.

1001.5 Work Practices.
   A. Prior to handling or transferring any chemical, and prior to starting work on any chemical piping or storage system, the employee shall locate and be familiar with the operation of eye wash stations and showers.
   B. All chemical materials shall be used according to the manufacturer’s intended purpose.
   C. All chemical hazards shall be identified and controlled prior to chemical use. (Corrosivity, flammability, reactivity, etc.).
   D. Siphons shall not be used to transfer liquid materials unless there is a mechanical way to start the siphon, and there is a way to control the shut-off of the siphon flow.

BLOODBORNE PATHOGENS

1002.1 BWL shall maintain a written Bloodborne Pathogen Exposure Control Program. The program contains requirements for exposure control,
employee training, and response procedures to prevent employee exposure to bloodborne pathogens.

1002.2 All injuries with blood or body fluids present shall be immediately reported to the Employee-in-Charge.

1002.3 Universal precautions shall be used when handling any material that has been contaminated with blood or other potentially infectious material.

1002.4 Contaminated waste shall be disposed of in red biohazard bags.

**1003 CHEMICAL MATERIAL STORAGE**

1003.1 Chemical materials shall be stored according to the manufacturer's recommendations for ventilation, temperature, humidity, reactivity, etc.

1003.2 Chemical materials shall be stored in capped or sealed containers.

1003.3 Chemical materials shall be stored in a secured location appropriate for the type of material and container size.

1003.4 Whenever possible, chemical materials should be kept in their original container with clearly identified labels.

1003.5 If a portable container is necessary, the container shall be clearly labeled and under direct control of the employee.

1003.6 Chemical storage areas shall be labeled with appropriate warning signs.

**1004 SPILL RESPONSE**

1004.1 Only employees trained on the specific chemical hazards shall respond to chemical material spills and clean-up.

1004.2 Employees in each work area shall have spill response training appropriate to the quantity and type of materials used.

1004.3 Each work area shall have readily available spill response materials and supplies appropriate for the quantity and type of materials used.

1004.4 All chemical spills shall be immediately controlled or contained according to the MSDS recommendations and regulatory requirements.

1004.5 Large quantity spills and hazardous material spill response may require outside assistance. For spill response assistance contact Environmental Services.

**1005 CHEMICAL AND BIOLOGICAL MATERIAL WASTE DISPOSAL**

1005.1 All chemical materials shall be disposed of according to the Material Safety Data Sheet.

   A. Non-hazardous material, empty and dry containers can usually be disposed of into the regular trash dumpsters.

   B. All non-hazardous material liquids shall be dried or solidified before disposal.

   C. Contact Environmental Services for disposal assistance.

1005.2 Large quantities of spilled chemical materials, absorbents, and contaminated soils, including transformer oil and fuel, may require alternate disposal procedures.

**1006 FLAMMABLE AND COMBUSTIBLE MATERIALS**

1006.1 Refer to the MSDS for specific information on flash point and flammability.

1006.2 No open flames shall be allowed where flammable materials are used or stored.

1006.3 All flammable material storage locations shall have the appropriate regulatory warning signs.
1006.4 Flammable and combustible materials shall not be transported in the same part of a vehicle in which people ride.
1006.5 Flammable and combustible materials shall be stored in the original container or fire resistant safety cans with flash screens and self-closing lids.
1006.6 Flammable and combustible materials shall be stored in approved inside rooms or storage cabinets.
1006.7 Connections on all flammable and combustible material drums and piping systems shall be vapor and liquid tight.
1006.8 When flammable liquids are transferred from one storage container to another container, the containers shall be effectively bonded and grounded to prevent sparking from the build up of static charge.
1006.9 Gasoline or naphtha shall never be used as a cleaning or degreasing agent.
1006.10 Nylon cloths shall not be used as wiping rags around flammable liquids due to sparks caused by static electricity.
1006.11 Fire extinguishing equipment shall be readily available when using flammable materials.

1007 BULK CHEMICAL TANKS AND STORAGE
1007.1 All chemical tanks, valves and transfer lines shall be labeled according to the BWL Hazard Communication Written Program.
1007.2 All bulk tank deliveries shall be verified for correct chemical material and delivery address prior to material off loading.
1007.3 Available tank volume shall be verified prior to material off loading.
1007.4 Bulk tanks shall have secondary containment specific to the chemical material and tank size.

1008 ACIDS AND BASES (CAUSTIC)
1008.1 Refer to the Material Safety Data Sheet for hazard identification, personal protective equipment and emergency response information.
1008.2 Do not store acids and caustic materials in the same location or storage cabinet.
1008.3 Do not mix acids and caustic materials unless in a controlled environment. Large amounts of heat and carbon dioxide may be generated.
1008.4 Do not add water to acids or caustic materials.

1009 CLEANING MATERIALS
1009.1 All cleaning materials, including general consumer products purchased in a retail store, shall have a MSDS on site when used for BWL work purposes.
1009.2 Refer to the MSDS sheet for hazard identification prior to using any cleaning material.
1009.3 All cleaning materials shall be used according to the manufacturer’s intended purpose.
1009.4 Do not mix cleaning materials. When mixed many commercial and general consumer products produce a violent reaction with toxic reaction products. Example: Never mix bleach and ammonia. Toxic reaction products are produced.
1009.5 Use only manufacturer approved cleaning materials in power washers or parts washing equipment.
1010  CHLORINE
1010.1 BWL shall maintain a written Chlorine Process Safety Management Plan, with requirements for hazard identification, work practices, emergency response and employee training for working with chlorine.
1010.2 Only employees trained on chlorine hazard and operating procedures shall be allowed to operate, maintain or repair the chlorine system.
1010.3 Respiratory protection is required when working on the chlorine system. Refer to the BWL Respiratory Protection Program and the Chlorine System Job Safety Analysis.
1010.4 A Safety Watcher shall be assigned for chlorine system maintenance and repair.

1011  PESTICIDES
1011.1 The term pesticide refers to all materials regulated by the Environmental Protection Agency or Michigan Department of Agriculture used to control insects, weeds or vegetation, algae, fungus, or rodents. (Michigan Act 451, Part 83, Pesticide Control, Regulation 636, Pesticide Applicators).
1011.2 A MSDS shall be available on-site for all pesticide products used by BWL employees.
1011.3 Certified Applicator or Registered Technician.
   A. Any BWL employee or contract employee using or applying a pesticide material on BWL property or during the course of work must be a Certified Applicator or a Registered Technician.
   B. The only exception to Certified Applicator or Registered Technician qualification status is if the product is in a pre-mixed “ready-to-use” container where there is no transfer or mixing of the product.
   C. Many of the over the counter products available to homeowners, that require dilution and mixing, require Registered Technician status when used in the course of employment.
1011.4 Pesticide Application Notification and Recordkeeping. (Required for BWL or contract service application).
   A. Application records must be kept for one year.
   B. Regulatory required notifications and postings must be made and remain in place for 24 hours.
1011.5 Storage and Disposal of Pesticide Containers and Products.
   A. All materials shall be stored in a secured, dry location.
   B. All containers and products shall be disposed of according to label instructions.
1011.6 Employee Work Practices.
   A. All pesticides shall be applied according to label instructions.
   B. Pesticides shall be applied from the original container. Mixing or product transfer is not allowed.
   C. Refer to the MSDS for specific personal protective equipment (PPE).
   D. Refer to MSDS for specific hazards and medical treatment.

1012  ASBESTOS
1012.1 Immediately contact Safety or Environmental Services Department if you suspect asbestos containing material damage or release.
1012.2 Assume unknown insulating material contains asbestos.
1012.3 Only employees who have received asbestos training can respond to an asbestos material release and clean-up.
1012.4  Do not drill, saw, grind, sand, or subject to any dust producing process asbestos containing material without adequate dust collection or dampening with a wetting agent (requires Asbestos Worker Certification).
1012.5  Avoid all contact with damaged, friable asbestos containing materials without proper training and personal protective equipment.
1012.6  If a suspect asbestos release occurs, where feasible, cover the material with plastic to isolate the material and immediately report the release to the Employee-in-Charge.

**1013  FLY ASH – INORGANIC ARSENIC**

1013.1  BWL shall maintain a written Fly Ash - Inorganic Arsenic Control Program with requirements for hazard identification, work practices and employee training for working with arsenic containing materials.
1013.2  Each department shall establish specific work practices for working with arsenic containing materials.
1013.3  **Hygiene.**
   A. No food, beverages, or smoking allowed in the work area.
   B. Employees shall thoroughly wash their hands and face prior to eating, smoking, or any other activity that may cause ingestion of arsenic containing material.
   C. Protective clothing shall be removed before leaving the immediate work areas and shall never be worn into the lunch room or removed from the work site.
1013.4  **Work Practices and Special Precautions.**
   A. As much as feasibly possible, fly ash should be removed from the work area prior to beginning the work assignment.
   B. Areas with fly ash accumulation shall not be cleaned with compressed air or air blowing equipment.
   C. All areas subject to high heat source (i.e., welding) should be mechanically cleaned prior to work.
   D. If possible, wet the material to minimize dusting.
   E. Shoveling and brushing may be used only if vacuuming or other relevant methods have been tried and found to be ineffective.
   F. If vacuuming methods are used the vacuums shall be used and emptied in a manner to minimize the reentry of fly ash into the workplace.

**1014  LEAD**

1014.1  BWL shall maintain a written Lead Control Program with requirements for hazard identification, work practices and employee training for working with lead containing materials.
1014.2  Each department will establish specific work practices for working with lead containing material.
1014.3  **Hygiene.**
   A. No food, beverages, or smoking allowed in the work area.
   B. Employees shall thoroughly wash their hands and face prior to eating, smoking, or any other activity that may cause ingestion of lead containing material.
   C. Protective clothing shall be removed before leaving the immediate work areas and shall never be worn into the lunch room or removed from the work site.
1014.4  **Work Practices and Special Precautions.**
A. Do not clean area with compressed air or air blowing equipment.
B. Temperatures over 700°F (371°C) will generate lead vapor. Example, welding or heat gun use on lead containing materials.
C. Glove bagging or “tenting” may be necessary to contain debris.
D. Ventilation systems may be required to provide clean air and dust control.

1014.5 Lead Waste Disposal.
A. All protective clothing shall be placed in a designated container for disposal. The container shall be identified as LEAD CONTAMINATED WASTE.
B. All debris shall be contained and be disposed of according to regulatory requirements.
C. Analytical lab testing may be required to determine waste characterization. Contact Environmental Services for assistance.

1015 SILICA
1015.1 BWL shall maintain a written Inorganic Silica Control Program with requirements for hazard identification, work practices and employee training for working with silica containing materials. Silica is found in coal dust, sand, cement, grout, and similar materials.
1015.2 Each department will establish specific work practices for working with silica containing material.
1015.3 Hygiene.
A. No food, beverages, or smoking allowed in the work area.
B. Employees shall thoroughly wash their hands and face prior to eating, smoking, or any other activity that may cause ingestion of silica containing materials.
C. Protective clothing shall be removed before leaving the immediate work areas and should never be worn into the lunch room or removed from the work site.
1015.4 Work Practices and Special Precautions.
A. As much as feasibly possible, coal dust should be removed from the work area prior to beginning the work assignment.
B. Do not clean the area with compressed air or air blowing equipment.
C. Where cutting and grinding is required wet methods should be used to minimize dust.
SECTION 1100
MATERIAL HANDLING AND STORAGE

1100 General
1101 Coiling Machines
1102 Material Uncrating and Unpacking
1103 Truck Loading and Unloading
1104 Material Storage
1105 Storage Bins, Racks, and Shelves
1106 Reels of Cable
1107 Pallets
1108 Truck Delivery
1109 Flammable Materials
1110 Heating Equipment
1111 Ash Handling
1112 Mail and Package Receiving

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1100 GENERAL MATERIAL HANDLING AND STORAGE
1100.1 Aisles, walkways, doors and emergency exits shall be kept clear.
1100.2 Stand clear of all moving equipment or backing trucks and trailers. Be aware that loads with overhanging ends, etc. may swing in a wide arc if the truck is turned.
1100.3 Do not stand under suspended loads.
1100.4 Employees shall obtain assistance in lifting heavy objects or use power equipment.
1100.5 When two or more persons carry a heavy object that is to be lowered or dropped, there shall be a prearranged signal for releasing the load.
1100.6 All material handling equipment shall have an adequate capacity for the load to be lifted. Charts shall be posted on the machine and the operator shall assure that the load is within the chart limits.
1100.7 Hand trucks shall be kept in good repair, inspected regularly and be parked where they shall not create a hazard.

1101 COILING MACHINES
1101.1 Only trained, qualified employees shall operate coiling machines.
1101.2 A face shield and eye protection shall be worn when using coiling machines.
1101.3 All loose clothing and hair shall be secured prior to using the coiling machines.
1101.4 To prevent kick-back the completed coil shall be properly secured before cutting and releasing it from the reel.

1102 MATERIAL UNCRATING AND UNPACKING
1102.1 Follow all manufacturers’ instructions printed on the cartons or crates.
1102.2 Proper tools (safety band cutters, box cutters, scissors, tin snips) shall be used when opening or uncrating materials.
1102.3 Band Cutting.  
   A. Clear the area of all employees not directly involved in the cutting operations.  
   B. Safety band cutters shall be used.  
   C. Be aware of stored energy in the band that may cause unpredictable movement.  
   D. Secure any materials which may shift when the band is released.  
   E. All bands shall be secured and disposed of properly.
1102.4 Remove all nails, staples and other sharp objects and properly or dispose of all packaging material.

1103 TRUCK LOADING AND UNLOADING
1103.1 The CDL driver is responsible for inspecting and approving loading and material positioning.
1103.2 All loads shall be secured to prevent shifting.
1103.3 Material that extends more than four feet beyond the front or back of the truck or trailer shall have warning devices attached.  
   A. During the day, bright orange or red flags shall be used.  
   B. At night or during periods of poor visibility, safety lights shall be used.
1104 MATERIAL STORAGE
1104.1 All material shall be stored in such a manner that it does not constitute a hazard to anyone working in the area.
1104.2 Plates and flat materials shall be safely secured when placed on edge and leaned against walls or railings.
1104.3 Pole Storage.
   A. All utility poles shall be stored in bunkers or an area specifically designated for pole storage.
   B. All poles shall be blocked and secured to prevent movement.

1105 STORAGE BINS, RACKS AND SHELVES
1105.1 Material shall be stored in bins, racks or shelves in such a manner that it does not constitute a hazard to anyone working in the area.
1105.2 All material shall be stacked, racked, blocked, interlocked or otherwise secured to prevent sliding, falling or collapse during storage or transit.
1105.3 All bins, racks and shelves shall be assembled and installed according to the manufacturer’s instructions.
1105.4 Material stored in bins, racks or shelves shall be within weight limits for the structure.
1105.5 Bins, racks, and shelves shall never be used as ladders.
1105.6 Material in bins, racks or shelves shall be kept at least 18 inches from any sprinkler heads.
1105.7 Bins, racks or shelves shall not be located where they block doorways or emergency exits.

1106 REELS OF CABLE
1106.1 Upright reels shall be blocked when stored.
1106.2 Cable ends shall be secured with a heavy staple or other means to prevent the wire or cable from springing free.

1107 PALLETS
1107.1 Pallets shall be inspected for broken boards or supports before moving.
1107.2 Broken pallets shall not be moved. The material shall be transferred to a new pallet.
1107.3 Material shall be secured or loaded to prevent load shifting or displacement from the pallet.

1108 TRUCK DELIVERY
1108.1 Truck engines shall be turned off when in the loading dock area whenever possible.
1108.2 Field Job Site Delivery.
   A. When arriving at the job site, a Tailgate Meeting shall be conducted to identify hazards of the job site.
   B. The driver shall inspect the delivery site for suitability or terrain problems.
   C. When a delivery vehicle is located in traffic, appropriate traffic cones, barricades or warning devices shall be used.
1108.3 Dock Locks.
   A. Dock locks shall be used on all vehicles with an ICC-bar restraint.
   B. Rear tires shall have wheel chocks or blocks if there is no ICC-bar restraint.
C. Dock locks, wheel chocks or blocks shall not be removed until the truck is unloaded and paper work completed.

1109 FLAMMABLE MATERIALS
1109.1 All flammable liquids shall be stored in approved, properly labeled safety containers. Gasoline, naphtha, lacquer thinner, and other solvents of this class shall be handled and dispensed only in UL approved, properly labeled (yellow letters) red metal safety cans.

1109.2 Flammable liquids shall be used only for their designed purposes. Gasoline, benzene, naphtha, lacquer thinner, etc. shall not be used for cleaning purposes, or for starting or kindling fires.

1109.3 Storage of open containers of flammable liquids and materials (grease, oil, paint, soiled rags, etc.) is prohibited.

1109.4 If flash point is 100 degrees or more, employees don’t have to store the contents in safety cans. However, ensure the container:
A. Is of good quality.
B. Has no leakage of liquid or vapor.
C. Is properly labeled.

1110 HEATING EQUIPMENT
1110.1 Heating equipment and/or torches used for soldering, welding, etc. shall not be lighted when being transported.

1110.2 Furnaces and torches shall be kept within the barricaded work area to guard against spills and shall be attended at all times. When necessary to leave molten materials unattended, adequate safety precautions shall be taken.

1110.3 Suitable guards shall be placed around lighted or hot furnaces to prevent accidental contact with the flame or furnace.

1110.4 A blowtorch or other open flame shall never be used to melt ice around a manhole or vault cover.

1110.5 Metals and insulating compounds shall be heated and handled in such a manner as to prevent hazards to the employee working in manholes or vaults, and to vehicular or pedestrian traffic.

1110.6 Gauntlet gloves shall be worn while heating or handling hot insulating compound.

1110.7 Compound shall never be removed from a container by heating the bottom until a vent has been provided along side of the can to relieve pressure.

1110.8 Workers should avoid standing over a solder pot as there is danger of an explosion if perspiration or moisture drops into hot solder. Cold solder and ladles should be heated before immersing in hot solder.

1110.9 Pot guards should be used on solder pot when being heated.

1110.10 Safety pothooks shall be used when lowering solder pots and compounds kettles. Solder ladles shall be lowered separately. In lowering bulky material, the hand line should be properly secured to prevent slipping.

1110.11 Before lowering hot solder or hot compound into a manhole or vault, those working in the hole shall be warned to stand clear. The worker on the surface shall not proceed to lower material until they have been instructed from below.

1110.12 Furnace and tanks containing liquefied petroleum gas such as butane or propane shall not be placed in a manhole or vault.
ASH HANDLING

11.1 Suitable clothing and protective equipment shall be worn when rodding, lancing or otherwise working on slag or ash through boiler access doors.

11.2 Close fitting and buttoned clothing at the neck, wrist, and ankles is suitable clothing protection.

11.3 Clear goggles are adequate while working through boiler ash pit openings or precipitators.

11.4 Welding type helmets with colored lenses are suitable protection while working through boiler furnace openings.

11.5 The operator shall keep the rod or lance away from his body to guard against falling slag or ash and to prevent the rod or lance from kicking upward when inserting or using a rod in an ash pit or furnace.

11.6 All rods or lances in the work area shall be considered hot.

11.7 Return to the provided rack all unused lances, rods or other tools.

11.8 Air or water hose connection couplings shall be wired or otherwise locked together.

11.9 Adequate railings shall be provided around elevated poke hole platforms.

11.10 Should an employee become dizzy or drowsy when working around ash handling equipment, the employee shall notify someone and immediately go to where there is fresh air.

MAIL AND PACKAGE RECEIVING

112.1 The BWL Print Shop courier shall be the contact with the U.S. Post Office and shall be responsible for the consolidation of mail and receipt thereof.

112.2 The Print Shop courier shall inspect all mail items at the Post Office and/or prior to entry into any BWL facility.

A. Suspicious items identified at the Post Office or prior to entry into a BWL building shall be left where discovered and BWL Security shall be notified.

B. Suspicious mail may exhibit excessive markings, excessive postage, no return address, sealing with tape, misspelled or poorly written words, incorrect titles, etc.

C. Deliveries attempted by a U.S. Postal Worker to a BWL facility shall be refused and the Postal Worker advised of the P.O. Box.

112.3 The BWL Purchasing and Warehousing Department (PWD) shall be the contact with all private couriers and responsible for the consolidation and coordination of deliveries.

A. To reach their intended destination, all items:

1. Shall be accounted for, inspected and inventoried by PWD, then:
   a. Delivered to the facility by PWD personnel, or
   b. Arranged to be picked up.

2. Shall be coordinated with PWD when delivery of chemicals and extraordinarily large items require direct delivery to the facility.

B. Suspicious items identified in any BWL facility shall be left where discovered and BWL Security shall be notified.

C. Suspicious items may exhibit protruding wires, aluminum foil or visible oil stains, the words “personal” or “private”, irregular shape, soft spots or bulges, buzzing or ticking sounds, etc.

D. Any delivery attempt made by private courier to a location besides PWD shall be refused and referred to PWD for appropriate receiving, unless alternative arrangement was previously made.
1112.4 After-hours, weekend or emergency deliveries shall be coordinated between BWL contact (delivery requestor), Security and PWD.

1112.5 Employees shall notify immediately both Safety and Security if an item is delivered and opened that appears to contain an unknown or suspicious substance.
SECTION 1200
VEGETATION MANAGEMENT

1201  General
1202  Working Near Energized Conductors
1203  Care and Use of Tools and Rope
1204  Portable Power Hand Tools
1205  Chippers
1206  Right-of-Way Clearing and Maintenance
1207  Herbicide Application

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1201 GENERAL

1201.1 All applicable sections of the BWL Safety Manual shall be followed. Please refer to the applicable sections as needed.

1201.2 A visual hazard assessment, including a root collar inspection, shall be performed on the tree prior to entering any tree or performing any work on a tree.

1201.3 Prior to any work being performed, the crew leader shall establish appropriate work zones.
   A. Those who have not taken part in the job briefing shall not enter those work zones.
   B. If someone who has not taken part in the job briefing does enter the work zones, all work shall be terminated until that person either leaves the work zone or is included in the job briefing.

1201.4 Climbing spurs shall have gaffs of a type and length compatible for the tree being climbed.

1201.5 Employees shall not use dead or rotted limbs for support, regardless of size.

1201.6 No work shall be done in a tree until the employee is securely tied in or belted to the tree.

1201.7 The climbing rope shall be crotched in such a manner as to prevent its "working out" on a lateral limb.

1201.8 When working in a multiple trunk tree, the climbing rope shall preferably be crotched around a main trunk other than the one on which the employee is working.

1201.9 Employees shall crotch their climbing rope in two places if a single crotch does not adequately protect them from falling into energized lines or falling back into the trunk of the tree.

1201.10 The climbing rope shall not be used as a pull rope or as a hand line to lower limbs or branches.

1201.11 The ground end of a climbing rope shall not be allowed to dangle over roadways and shall be kept free from obstructions, passing vehicles, etc.

1201.12 The friction hitch shall not be released until the climber is on the ground.

1201.13 Branches or other material shall not be dropped unless the immediate area has been cleared so that there is no possibility of injury to persons or damage to property. If such a possibility exists, a rope shall be used to lower branches or other materials.

1201.14 When lowering heavy tree members, employees shall not tie fall lines around hands or bodies.

1201.15 Employees shall not attempt to clear limbs or brush from under that side of tree where the Line Clearance Arborist is working.

1201.16 Employees shall obtain assistance or use power equipment, if available, when lifting logs or other heavy loads.

1201.17 When it is necessary to work in the vicinity of poison ivy, poison oak, or poison sumac, employees shall keep sleeves rolled down and wear gloves.

1202 WORKING NEAR ENERGIZED CONDUCTORS

1202.1 Wires in proximity to tree work shall be considered as energized, unless proven to be dead and grounded.
1202.2 A second Line Clearance Arborist shall be within normal voice communication and have climbing gear readily available to the work area if any of the following conditions exist:
   A. If a Line Clearance Arborist is to approach closer than 10 feet to any conductor or electrical apparatus energized or capable of being energized at more than 600 volts.
   B. If branches or limbs being removed are closer to lines energized or capable of being energized at more than 600 volts or are within the distances listed in the table in Section 501 of the BWL Safety Manual.
   C. If roping is necessary to remove branches or limbs from conductors or apparatus energized or capable of being energized at more than 600 volts.

1202.3 Line Clearance Arborists shall maintain clearances from energized conductors as shown in the table from the BWL Safety Manual Section 501.

1202.4 Line Clearance Arborists shall use insulating tools when removing branches that are contacting exposed energized conductors or equipment 600 volts or higher or that are within the distances (or have the potential to become within the distances) specified in the table in Section 501 of the BWL Safety Manual.

1202.5 Care shall be taken to prevent limbs being removed from coming in contact with Line Clearance Arborists’ body.

1202.6 Ladders, platforms, and non-insulated tools shall not be brought closer to an energized conductor or apparatus than the distances listed in the table in Section 501 of the BWL Safety Manual.

1202.7 All insulated tools shall be tested and maintained annually, at a minimum.

1202.8 Tree work shall terminate and employees shall move to a place of safety during electrical storms and periods of high winds or other unusual weather conditions that are dangerous to employees.

1202.9 Employees shall not remove tree limbs or branches from above energized conductors while other employees are working in trees below the conductors in the same span.

1202.10 Broken or fallen wires shall not be handled except by persons qualified in such work.

1202.11 When working near wires, employees shall have their climbing rope secured so that, in the event they slip or a limb breaks, they will swing free and clear of the wires.

1202.12 Tree limbs shall not be dropped on conductors.

1202.13 Ropes shall not be thrown over conductors or crossarms for the purpose of using the conductor or crossarm as a support or hitch.

1202.14 Dry ropes shall be used in trees through which energized conductors pass.

1202.15 For additional information concerning working near energized conductors, refer to MIOSHA Part 53.

1203 CARE AND USE OF TOOLS AND ROPE

1203.1 Line Clearance Arborists shall inspect all climbing lines, work lines, lanyards, and other climbing equipment for damage, cuts, abrasions, and/or deterioration before each use and shall remove them from service if signs of excessive wear or damage are found.
1203.2 Ropes shall be kept away from fire, acids, oil, chemicals, and all sources of excessive heat.
1203.3 Ropes shall be stored separately from sharp-edged cutting tools.
1203.4 Dragging ropes over rough surfaces and sharp objects, such as rocks, shall be avoided.
1203.5 The cutting edge of tools shall be suitably sheathed or guarded except while in actual use. Cutting tools shall be kept sharp and properly shaped.
1203.6 When not in actual use, the Line Clearance Arborist’s saw shall be returned to the scabbard.
1203.7 Tools shall not be thrown into or dropped from a tree; they shall be raised or lowered by a suitable rope line.
1203.8 A pruner shall not be laid on a limb or in a crotch, or hooked on a wire rope. It shall be hooked over a limb strong enough to hold its weight.
1203.9 Ladders shall be removed from the base of the tree when not in use.
1203.10 Climbing ropes shall have a minimum diameter of one-half inch (12.7mm) with a minimum breaking strength of 5,400 pounds (24.2 kN). Synthetic rope shall have an elasticity of not more than seven percent.
1203.11 Ropes shall be coiled and piled, or suspended so that air can circulate through the coils.
1203.12 Rope ends shall be finished in a manner to prevent raveling.
1203.13 A rope that has compromised insulation (for instance, wet or contaminated) may not be used near exposed energized lines.

1204 PORTABLE POWER HAND TOOLS
1204.1 Prior to any power tools being used, the manufacturer’s operating and safety manual shall be read, understood, and followed. This manual shall be reviewed annually.
1204.2 Power tools shall not be operated unless the manufacturer’s safety devices are in proper working order. Safety devices shall not be removed or modified.
1204.3 When climbing in a tree, no work with a chainsaw shall be performed until the Line Clearance Arborist uses a second point of attachment to the tree.
1204.4 Chainsaw operators shall inspect the saw before each use to assure that all handles and guards are in place and tight, that all controls function properly, and that the muffler is operational.
1204.5 Power saws weighing more than 15 pounds that are used in trees shall be supported by a separate line or tool lanyard, unless the work is performed from an aerial lift.
1204.6 When starting a chainsaw on the ground, it shall be placed on or against a solid support and the area cleared of all co-workers. The chain saw shall be started with the chain brake engaged.
1204.7 The chain saw shall be held with the thumbs and fingers of both hands encircling the handles during operation unless the employee demonstrates that a greater hazard is posed by keeping both hands on the chain saw in that particular situation.
1204.8 Chainsaw operators shall, when necessary, clear the immediate area around their work to make certain that brush will not interfere with either the chainsaw or operator.
1204.9 The chainsaw engine shall be stopped for the following:
   A. When working on any part of the unit.
B. While the unit is being moved from one location to another, including being carried up into the tree.
C. While the unit is unattended.
D. While the unit is being fueled.

1204.10 If gas is being spilled on the chainsaw during refueling, it shall be wiped off before the engine is started. Chainsaws shall not be started within 10 feet of a fueling area.

1204.11 Employees shall not approach a chainsaw operator within the reach of the saw while the saw is in operation.

1204.12 Powered tools shall not be left unattended if connected to a power source.

1204.13 Powered tools shall not be adjusted or repaired while connected to power source.

1204.14 For additional information concerning power trimming equipment see MIOSHA Part 53.

1205 CHIPPERS
1205.1 Prior to any chippers being used, the manufacturer’s operations and safety manual shall be read, understood, and followed. This manual shall be reviewed annually.

1205.2 No chipper shall be operated unless the manufacturer’s safety devices are in proper working order. Safety devices shall not be removed or modified.

1205.3 Access panels for maintenance and adjustment of the chipper blades and associated drive train shall be in place and secure during operation.

1205.4 Tear away traffic vests shall be used while operating any chipper near a roadway.

1205.5 An employee shall never place hands or another part of their body into the brush hopper while chipper is in operation.

1205.6 Tools or other metallic objects shall not be used to push brush into the chipper. Sweepings, which may contain foreign objects such as stones and nails, shall be loaded on the truck and not fed into the chipper.

1205.7 The ignition key shall be removed when the chipper is left unattended.

1205.8 Employees shall only use wrist-length (non-gauntlet) gloves while feeding a chipper.

1205.9 The chipper shall not be operated when only one person is on the crew.

1205.10 Brush chippers shall be equipped with a locking device in the ignition system.

1205.11 For additional information on chippers, refer to MIOSHA part 53 and OSHA Standard 29 CFR 1910.269.

1206 RIGHT-OF-WAY CLEARING AND MAINTENANCE
1206.1 When two or more employees are cutting brush, they shall be separated by at least 10 feet.

1206.2 Employees shall not anchor equipment to railroad tracks, fences, or other non-BWL structures.

1206.3 When emerging from right-of-way, prior to road travel, employees shall test brakes.

1207 HERBICIDE APPLICATION
1207.1 Before any herbicide application is made, the applicator must obtain their certification with the Michigan Department of Agriculture.
1207.2 Before using any herbicide employees shall read, understand, and follow the label. Spraying shall not be done when wind exceeds 15 mph unless specifically authorized by the supervisor.

1207.3 Brush shall not be sprayed at a distance greater than 15 feet from a power spray nozzle.

1207.4 Foliage and basal sprays shall not be used on wild cherry trees in areas where livestock may graze because of poisonous acid that is generated.

1207.5 Herbicides and other chemicals shall never be left where they would create a hazard to persons or property.

1207.6 Empty containers shall be disposed of in an approved manner.
DEFINITIONS

A

AC: Alternating current.

Abrasions: The wearing, grinding, or rubbing away by friction, such as on the skin.

Accident Prevention Program: The program by which an employer provides instruction and safety training to an employee in the recognition and avoidance of hazards.

Acute Exposure: Exposure to a toxic substance that results in severe biological harm or death. Acute exposure is usually characterized as lasting no longer than a day.

Aerial Device: Any piece of equipment utilizing a bucket or platform to place the worker(s) at an elevated worksite.

Affected Employee: An employee whose job requires him to operate, use, or work in the area where servicing or maintenance is being performed on a machine or equipment under Lockout/Tagout.

Alive or Live: Electrically connected to a source of potential difference or electrically charged so as to have a potential significantly different from that of the earth in the vicinity. The term “live” is sometimes used in place of the term “current-carrying” where the intent is clear, to avoid repetition of the longer term.

Anchorage: A secure means of attachment for lifelines, lanyards, and straps.


Approved: The term “approved”, when used in connection with methods, tools, or equipment, refers to the methods, tools, or equipment approved by the BWL through committee, departmental action, or safety rule.

Asbestos: A naturally occurring mineral fiber that is used for thermal insulation. Chronic inhalation exposure can lead to a lung disease called asbestosis, lung cancer, or mesothelioma.

Authorized Employee: A person who applies the locks or tags on machines or equipment to be serviced.

Automatic Circuit Recloser: A self-controlled device for interrupting and re-closing an alternating current circuit with a predetermined sequence of opening and re-closing followed by resetting, hold-closed, or Lockout operation.

B

Backreamer: A downhole tool that increases the diameter of a pilot bore hole to accommodate the size of the product being pulled.
Barricade: A physical obstruction such as tapes, cones, or A-frame type wood, plastic or metal structures intended to provide a warning about and to limit access to a hazardous area.

Barrier: A physical obstruction which is intended to prevent contact with energized lines or equipment or to prevent unauthorized access to a work area.

Benching (Benching System): A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near vertical surfaces between levels.

Body Belt (Safety Belt): A strap that both secures around the waist and attaches to a lanyard, lifeline, or strap.

Body Harness: Straps that are secured on an employee in a manner that distributes the arresting forces over at least the thighs, shoulders, and pelvis with provisions for attaching a lanyard, lifeline, or deceleration device.

Bond: The electrical interconnection of conductive parts designed to maintain a common electrical potential.

Bus: A conductor or a group of conductors that serve as a common connection for two or more circuits.

Bushing: An insulating structure, including a through conductor or providing a passageway for such a conductor, with provision for mounting on a barrier, conducting or otherwise, for the purpose of insulating the conductor from the barrier and conducting current from one side of the barrier to the other.

C

Cable: A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

Cable Sheath: A conductive protective covering applied to cables. A cable sheath may consist of multiple layers of which one or more is conductive.

Capable of Being Locked Out: An energy isolating device that has either a built-in locking mechanism; a hasp or other means of attachment to or through which a lock can be affixed; or that can be locked out without being dismantled, rebuilt, or replaced, or having its energy control capabilities permanently altered.

Carcinogen: A substance that causes cancer. A cancer is characterized by the growth of abnormal cells, sometimes in the form of a tumor. Examples of carcinogens include: asbestos, vinyl chloride, and benzene. Substances regulated by OSHA as carcinogens would be found in 29 CFR Subpart Z.

Carcinogenic: Cancer-producing.
Catastrophic Release: A major uncontrolled emission, fire, or explosion involving one or more hazardous chemicals that presents serious danger to employees or the public.

Caustic: Capable of destroying or eating away by chemical action, corrosive. A material with a pH less than 7.0.

Chemical: According to OSHA, “any element, chemical compound, or mixture of elements and/or compounds.”

Chemical-Protective Clothing: Clothing that may be resistant to chemical permeation, penetration, or degradation.

Chronic: A human health problem whose symptoms develop slowly over a long period of time. Chronic effects are the result of long-term exposure and are long-lasting.

Circuit: A conductor or system of conductors through which an electric current is intended to flow.

Circuit Breaker: A device designed to open and close a circuit of up to 600 volts and to open the circuit automatically on a predetermined over-current without injury to itself when properly applied within its ratings. Over 600 volts, it’s capable of making, carrying, and breaking currents under normal circuit conditions. Under specified abnormal conditions, such as a short circuit, it is able to make and break currents and carry them for a specified time.

Clear Hot Stick Distance: The minimum distance for the use of live-line tools held by line workers when performing live-line work.

Clearance (LOTO): This is a commonly used term to refer to LockOut/Tagout. A process or procedure of controlling hazardous energy sources (electrical, mechanical, chemical, pressure, thermal, pneumatic, gravity, hydraulic) on equipment, electrical circuits, or systems using a system of locks, tags and communication for the purpose of employee safety and protection.

Clearance (between objects): The clear distance between two objects measured surface to surface.

Clearance (for work): Authorization to perform specified work or permission to enter a restricted area.

Code of Federal Regulations (CFR): The collection of rules and regulations originally published in the Federal Register by various governmental departments and agencies. OSHA regulations are found in 29 CFR.

Combustible Liquids: Any liquid having a flash point greater than 100° F. (NFPA 30)

Communication Lines: See Lines, Communication.
**Competent Person:** (MIOSHA definition) A person who is experienced and capable of identifying an existing or potential hazard in surroundings or under working conditions which are hazardous or dangerous to an employee and who has the authority and knowledge to take prompt corrective measures to eliminate the hazards.

**Compliance:** Meeting all the requirements of the law.

**Conductive:** Having the quality or power to conduct or transmit electricity, heat, sound, or light.

**Conductor:** A material, usually in the form of a wire, cable, or bus bar, or other things (including the human body), used for carrying an electric current.

**Confined space:** A space that: (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and (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); and (3) Is not designed for continuous employee occupancy. (MIOSHA Part 90 and 490).

**Container (OSHA):** “Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes and piping systems are not considered to be containers.” Note that some state right-to-know laws consider pipes to be containers.

**Contaminate:** To soil, stain, corrupt, or infect by contact or association.

**Contractor:** Organization retained by BWL to perform work on BWL property or right-of-way.

**Corrosive:** A chemical that causes the destruction of living tissue by chemical action at the site of contact.

**Covered Conductor:** A conductor covered with a dielectric having no rated insulating strength or having a rated insulating strength less than the voltage of the circuit in which the conductor is used.

**Current-Carrying Part:** A conducting part intended to be connected in an electric circuit to a source of voltage. Non-current-carrying parts are those not intended to be so connected.

**Decontaminate:** The freeing of a person or object of some contaminating substance (such as radioactive material, organisms, chemicals, soil, etc.).

**De-energized:** Free from any electrical connection to a source of potential difference and from electric charge; not having a potential different from that of the earth.

**Designated Employee (MIOSHA):** A qualified person designated to perform specific duties under the existing conditions.
Device: A unit of an electrical system that is intended to carry, but not use, electric energy.

Directional Boring Machine: A steerable, horizontal boring machine that allows trenchless installation of underground utilities.

Direct Buried Cable (DBC): Electrical cable which is specially designed to be buried under the ground without any kind of extra covering, sheathing or piping to protect it.

Disinfectant: An agent or chemical that destroys harmful microorganisms and eliminates infection.

Disciplinary Action: Administrative action taken by the employer against the employee; may vary from verbal reprimand to dismissal.

Disconnected: Detached from any energy source.

Disconnecting Means: A device, devices, or other means used to disconnect a circuit’s conductors from their source of electric supply.

Documentation: The record of compliance with OSHA regulations that a company should maintain records, in paper or electronic form, required to verify operating procedures, programs, training, attendance, or inspections and maintenance.

Durable: A quality of Lockout and Tagout devices. It means they’re capable of standing up to the environment to which they are exposed for the maximum period of time that exposure is expected.

E

Earmuffs: Padded cushions on a headband that cover the ears, used to protect ears from excessive noise.

Earplugs: Foam or other molded plugs that fit into the ear canal used to protect your ears from excessive noise.

Effectively Grounded: Intentionally connected to earth though a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages that may result in undue hazard to connected equipment or to persons.

Electric Line Truck: A truck used to transport personnel, tools, and material for electric supply line work.

Electric Supply Equipment: Equipment that produces, modifies, regulates, controls, or safeguards a supply of electric energy.


Electric Utility: An organization responsible for the installation, operation, or maintenance of an electric supply system.
**Electrical Energy:** Power that comes from electrical currents that flow through conductors such as wires and cables.

**Electrical Shock:** Electrical current that enters the human body, which can cause bodily harm/damage (i.e. pain, internal bleeding, damage to muscles, nerves, or tissues, cardiac arrest, or death).

**Emergency:** An unusual condition which endangers life and/or property.

**Employee:** Any person who receives a paycheck from the BWL to perform work.

**Employee-in-Charge or Supervisor:** Any person, regardless of classification, who is directly in charge of a specific job or specific jobs. (Depending upon local classification, this person may be a leader, working supervisor, crew leader, acting crew leader, general supervisor, supervisor, or superintendent, manager, engineer, etc.)

**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, in addition, no pole can be operated independently; 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.

**Enclosed:** Surrounded by a case, cage, or fence, which will protect the contained equipment and prevent accidental contact of a person with live parts.

**Enclosed Space:** A working space, such as a manhole, vault, tunnel, or shaft, that has a limited means of egress or entry, that is designed for periodic employee entry under normal operating conditions, and that under normal conditions does not contain a hazardous atmosphere, but that may contain a hazardous atmosphere under abnormal conditions.

**Energized:** Connected to an energy source or containing residual or stored energy.

**Energy:** Movement or the possibility of movement. Forms of energy include: electrical, hydraulic, pneumatic, and mechanical.

**Energy Control Program:** An OSHA-required employer program to prevent unexpected machine or equipment energizing or start-up, or release of stored energy that could cause movement during service or maintenance. The program consists of employee training, energy control procedures including Lockout/Tagout, and periodic inspections to ensure that machines or equipment are isolated from their energy source and rendered inoperative before any employee performs service or maintenance.
Energy Isolating Device: A physical device that prevents the transmission or release of energy, including, but not limited to, the following: a manually operated electric circuit breaker, a disconnect switch, a manually operated switch, a slide gate, a slip blind, a line valve, blocks, and any similar device with a visible indication of the position of the device. (Push buttons, selector switches, and other control-circuit-type devices are not energy isolating devices.)

Energy Source: Any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, thermal, or other energy source that could cause injury to personnel.

Entry Attendant: An employee assigned to remain immediately outside the entrance to an enclosed or other space to render assistance as needed to employees inside the space.

Equipment (electric): A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like used as part of or in connection with an electrical installation.

Excavations: Any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.

Exposed: Not isolated or guarded.

Exposure: The condition of being subject to some effect of influence.

Eye Hazards: Hazards that pose a risk to the eye or ability to see.

Eye Loupe: A small, high-powered magnifying lens held close to the eye.

Face Shield: Clear or tinted window attached to a frame that fits over the face for protection.

Fall Arrest System: A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard, deceleration device, or life line. Use of a body belt in a fall arrest system is prohibited.

Fall Protection Program: A program intended to protect workers from injury due to falls when working at elevation.

Fell: The process of severing a tree from the stump so that it drops to the ground. “Feller” is the person who fells the tree.

Field Control: Authority granted to the Person-in-Charge by an Electric System Operator to oversee and coordinate the operation of high voltage switches within a specific area.

Flameproof: Resistant to damage or burning on contact with flame.
Flame-Resistant Clothing (FR or FRC): Clothing made from material having a property whereby combustion is prevented, terminated or inhibited following the application of a flame or non-flame source of ignition.

**Flammable:** Capable of being easily ignited and of burning quickly.

**Flammable Liquid:** Any liquid having a flash point less than 100° F (NFPA 30).

**Flares:** Flares, torches, fuses, red lanterns, reflectors, or any other equipment that is adaptable for the purpose intended.

**Free Fall:** The act of falling before the personal fall protection system begins to arrest the fall.

**Goggles:** Eye coverings that seal around the eyes and are held securely to the head with a strap or headband.

**Ground:** (noun) The connection, established either intentionally or accidentally, of an electric circuit or equipment with reference ground through a conductor, or other conducting object or substance.

**Ground:** (reference) That conductive body, usually earth, to which an electric potential is referenced.

**Ground:** (verb) Connecting or establishing a connection, either intentionally or accidentally, of an electric circuit or equipment to reference ground. Connected to earth or to some conducting body that serves in place of earth.

**Grounded:** Connected to earth or to some conducting body that serves in place of the earth.

**Grounding Electrode (Ground Electrode):** A conductor embedded in the earth, used for maintaining ground potential on conductors connected to it and for dissipating into the earth current conducted to it.

**Grounded System:** A system of conductors in which at least one conductor or point (usually the middle wire or neutral point of transformer or generator winding) is intentionally grounded, either solidly or through a current-limiting device (not a current-interrupting device).

**Guarded:** Covered, fenced, enclosed, or otherwise protected, by means of suitable covers or casings, barrier rails or screens, mats, or platforms, designed to minimize the possibility, under normal conditions, of dangerous approach or accidental contact by persons or objects. **Note:** Wires which are insulated, but not otherwise protected, are not considered as guarded.
Hard hat: A protective hat made of rigid material, such as metal or fiberglass, which protects the head from injury.

Hazard Communication Program (Right-to-Know): A program to ensure protection of employees from potential chemical hazards. Includes training, MSDS, safe work practices.

Hazard Identification Analysis Form: A checklist style form used at the job site, which will aid the employee in identification and control of hazards associated with the site and the work to be performed.

Hazard Warning (OSHA): “Means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the hazards of the chemical(s) in the container(s).” A hazard warning is one of the types of information required on a container. See also Label.

Hazardous Atmosphere: (MIOSHA Part 90 and 490) An atmosphere that may expose employees to the risk of death, incapacitation or impairment of ability to self-rescue (that is, escape unaided from an enclosed space), injury, or acute illness from one or more of the following causes:
1. Flammable gas, vapor, or mist in excess of 10 percent of its Lower Flammable Limit (LFL) or Lower Explosive Limit (LEL).
2. Airborne combustible dust at a concentration that meets or exceeds its LFL. (This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet (1.52 m) or less).
3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.
4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in MIOSHA, Occupational Health Standards, Chapter III, Health Hazard Control Measures, or in MIOSHA, Occupational Health Standards, Chapter II, Air Contaminants and Physical Agents, and which could result in employee exposure in excess of its dose or permissible exposure limit.
5. Any other atmospheric condition that is immediately dangerous to life or health.

Hazardous Chemical (OSHA): “Means any chemical which is a physical hazard or a health hazard.” See also Health Hazard; Physical Hazard.

Hazardous Substance: Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive.

HazCom: See Hazardous Communication Program. Chemical hazards.

Health Hazard (OSHA): "Means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees."

High-Powered Tests: Tests in which fault currents, load currents, magnetizing currents, and line-dropping currents are used to test equipment, either at the equipment’s rated voltage or at lower voltages.
High-Voltage Tests: Tests in which voltages of approximately 1000 volts are used as a practical minimum and in which the voltage source has sufficient energy to cause injury.

High Wind: A wind of such velocity that the following hazards would be present:
1. An employee would be exposed to being blown from elevated locations, or
2. An employee or material handling equipment could lose control of material being handled, or
3. An employee would be exposed to other hazards not controlled by the standard involved. Note: Winds exceeding 40 miles per hour (64.4 kilometers per hour), or 30 miles per hour (48.3 kilometers per hour) if material handling is involved, are normally considered as meeting this criteria unless precautions are taken to protect employees from the hazardous effects of the wind.

Hot Line Tools and Ropes: Those tools and ropes that are especially designed for work on energized high voltage lines and equipment. Insulated aerial equipment especially designed for work on energized high voltage lines and equipment shall be considered “hot-line”.

Hot Tap: A procedure used to install connections or parts during repair, maintenance, and service activities that involve welding on pipelines, vessels, or tanks under pressure. It is used to replace or add pipeline sections without interrupting service for air, gas, water, steam, and petrochemical distribution systems.

Hot Work Permit: An employer’s written authorization to perform operations capable of producing a source of ignition.

Hydraulic Energy: Power that is created by water or other pressurized fluid that moves through pipes or hoses.

Immediately Dangerous to Life or Health (IDLH): Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual’s ability to escape unaided from a permit space. (MIOSHA Part 90 and 490)

Impervious: Unable to be penetrated (e.g., by a chemical).

Ingest: To take in, as if for digestion.

Inhalation: Chemicals that enter the body by breathing in and that may have local effects and/or may be absorbed into the bloodstream through the lungs.

Insulated: A conductor wrapped in rubber or other materials that keep the electric current on its path and help prevent shock and fires.

Insulation (cable): That which is relied upon to insulate the conductor from other conductors or conducting parts or from ground.
Job Briefing: (Tailgate) A meeting held at the start of the shift or job assignment where workers and supervisors/leaders/Employee-in-Charge get together to discuss the work assignment, including hazards associated with the work.

Job Safety Analysis: A formal evaluation of the hazards associated with a particular task and a determination of the adequate hazard controls that must be in place to safeguard employees including an assessment of required PPE.

Jobsite: The point where the employees are assembled to perform the work.

Label (OSHA): “Any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.”

Lanyard (Strap): A flexible line used to secure a body belt or body harness to a lifeline or directly to a point of anchorage.

Leggings: Protective coverings worn over the leg from the knee to ankle.

Lifeline: A line provided for direct or indirect attachment to a worker's body belt, body harness, lanyard, or deceleration device. Such lifelines may be horizontal or vertical in application.

Line-Clearance Tree Trimming: The pruning, trimming, repairing, maintaining, removing, or clearing of trees or the cutting of brush that is within 10 feet (305 cm) of electric supply lines and equipment.

Lines, Communication Lines: The conductors and their supporting or containing structures which are used for public or private signal or communication service, and which operate at potentials not exceeding 400 volts to ground or 750 volts between any two points of the circuit, and the transmitted power of which does not exceed 150 watts. If the lines are operating at less than 150 volts, no limit is placed on the transmitted power of the system. Under certain conditions, communication cables may include communication circuits exceeding these limitations where such circuits are also used to supply power solely to communication equipment.

Note: Telephone, telegraph, railroad signal, data, clock, fire, police alarm, cable television, and other systems conforming to this definition are included. Lines used for signaling purposes, but not included under this definition, are considered as electric supply lines of the same voltage.

Lines, Electric Supply Lines: Conductors used to transmit electric energy and their necessary supporting or containing structures.

Lockout Device: A key or combination lock, blank flange, bolted slip blind, or other positive means used to hold an energy isolating device in a safe position and prevent the machine or equipment from energizing.

Lockout - The placement of a Lockout device on any energy isolating device such that the equipment cannot be operated until the Lockout device is removed.
**LOTO – Lockout/Tagout.**

**M**

**Machine Guards:** Safety devices used on or around machinery to help prevent injury to employees.

**Manhole:** A subsurface enclosure which personnel may enter and which is used for the purpose of installing, operating, and maintaining submersible equipment or cable.

**Manhole Opening:** An opening through which persons may enter into a confined or enclosed space.

**Manhole Steps:** A series of steps individually attached to or set into the walls of a manhole structure.

**Material Safety Data Sheet (MSDS):** A document provided by chemical manufacturers to convey information to the users of their products. The information includes data on physical characteristics, fire and explosion hazards, reactivity, exposure limits, storage and handling, health hazards; special precautions; and fire and spill response procedures.

**Mechanical Energy:** Power that is created by built-up energy, such as in springs.

**Minimum Approach Distance:** The closest distance an employee is permitted to approach an energized or a grounded object.

**MSD:** Musculoskeletal disorder. Painful occupational illnesses that develop over time. Caused by constant repetitive motion causing damage to the muscles, tendons, and/or nerves in the hands, wrists, elbows, back, neck, and/or shoulders. Most-common MSDs include tendonitis, carpal tunnel syndrome, Reynaud’s syndrome, and tenosynovitis.

**MSDS:** Material Safety Data Sheet. See Material Safety Data Sheet.

**N**

**Near Miss:** An unintended, unplanned, or unexpected event that could have, but did not, result in personnel injury or property damage.

**Neoprene:** A synthetic rubber characterized by superior resistance.

**NIOSH:** National Institute for Occupational Safety and Health.

**Nonconductive:** The inability to conduct or transmit electricity, heat, sound, or light.

**O**
OSHA: Occupational Safety and Health Act (OSHA) of 1970: Requires employers to provide to employees a workplace free from recognized hazards and to comply with safety and health standards established by the Act. The Act also charges each employee with a legal duty to comply with the Act’s safety and health standards. The federal Act pertains to most employers but specifically excludes federal, state, and local government employees. However, numerous states have developed safety and health standards that require compliance by all government entities.

P

Pad Mount: Transformer or equipment in a surface-mounted enclosure normally worked from ground level.

Penetration: A chemical’s passage through an opening in a protective material.

Periodic Inspection: An OSHA-required inspection of energy control procedures conducted by employers at least annually. The inspection of particular employees and procedures must be conducted by an authorized employee who is not involved with the inspected procedures.

Permeation: The passage of a chemical through a piece of clothing on a molecular level, even if the material has no visible holes.

Permit-Required Confined Space (permit space): A confined space that has one or more of the following characteristics: (1) Contains or has a potential to contain a hazardous atmosphere; (2) Contains a material that has the potential for engulfing an entrant; (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or (4) Contains any other recognized serious safety or health hazard. (MIOSH Part 90 and 490)

Personal Fall Arrest System: A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard, deceleration device, or life line. Use of a body belt in a fall arrest system is prohibited.

Personal Monitoring Device: A battery operated Radio Frequency Exposure (RFE) monitoring device that is designed to be worn on a person and which will alarm when the RFE exposure exceeds 50 percent of the Maximum Permissible Exposure Limit (MPE) for occupational environments.

Personal Protective Equipment (PPE): Devices or clothing designed to protect against workplace hazards.

Physical Hazard (OSHA): “Means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water-reactive.” Any chemical that can be classified as a physical hazard is considered to be a hazardous chemical under the law. See also Hazardous Chemical.
Physically Render Inoperative: The use of locks, blind flanges, or other similar devices or procedures to prevent the operation of switches, breakers, valves, and operating controls.

Polychlorinated Biphenyls (PCBs): A chlorinated, hazardous, nonconductive and noncombustible liquid used in some transformers and capacitors. It has several trade names — Pyranol, Askeral, Inerteen, etc.

Positioning Device: A body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface such as a wall or pole and to work with both hands free. Positioning devices may also be used for leading edge work or in aerial lift and work platforms in a manner that will prevent employee movement beyond the edge or equipment barrier.

Puncture: To pierce with a sharp point.

Primary Compartment: A compartment containing voltages greater than 600 volts.

Primary Voltage: Any electrical circuit that normally operates at more than 600 volts.

Protective System: A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Public: Any individual not an employee or representative of the BWL.

Qualified Person (MIOSHA): A trained person possessing a recognized degree or certificate of professional standing or who, by extensive knowledge, training, and experience, has demonstrated the ability to solve or resolve problems relating to the subject matter and work.

Qualified Person (Part 86, Electric Power Generation, Transmission and Distribution): One knowledgeable in the construction and operation of the electric power generation, transmission, and distribution equipment involved, along with the associated hazards. Qualified employees shall be trained and competent in the:
   1. Skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment.
   2. Skills and techniques necessary to determine the nominal voltage of exposed live parts.
   3. Minimum approach distances corresponding to the voltages to which the qualified employee will be exposed.
   4. Proper use of precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment.
An employee who is undergoing on-the-job training and who, in the course of that training, has demonstrated an ability to perform duties safely at their level of training and who is under the direct supervision of a qualified employee is considered to be a qualified employee for the performance of those duties. An employee undergoing on-the-job training must meet the full requirements for fall protection.

R

Radiation: Energy radiated in the form of rays, waves, or streams of energetic particles.

Radio Frequency (RF): For the purposes of the Federal Communications Commission (FCC) standard, the frequency range is from 3 kHz to 300 GHz.

Reactivity: A measure of the tendency of a substance to undergo chemical reaction with the release of energy.

Red Box: A red painted box used to cover a switch on a control panel and it signifies “DO NOT OPERATE”. It is used for informative purposes and must be tagged with the reason it is being used. The Red Box cannot be used in place of a required Clearance.

Reduced Visibility: Times when normal visibility is reduced because of insufficient daylight (dawn or dusk) or adverse weather conditions such as fog, heavy rainfall, or snow.

Registered Professional Engineer: A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer registered in any state is deemed to be a “registered professional engineer” when approving designs for “manufactured protective systems” or “tabulated data” to be used in interstate commerce.

Respirator: Device designed to protect the wearer from inhaling harmful contaminants.

Respiratory System: The system necessary for breathing and the channels by which they connect with the outer air.

Right-to-Know: A term applied to a variety of laws and regulations enacted by municipal, county, and state governments that provide for the availability of information on chemical hazards; also includes the OSHA Hazard Communication Standard. See also HazCom.

Roadway: The road and the areas immediately adjacent thereto, such as the shoulder of the road, parking strip, etc. This area normally extends approximately 15 feet from the road edge.

Rope Grab: A device that attaches to a lifeline as an anchoring point to provide a means for arresting a fall.
Safety Can: An approved metal or nonmetallic container which has a capacity of not more than five gallons, which has a flash-arresting screen, spring closing lid and spout cover, and which is designed so that it will safely relieve internal pressure when exposed to fire.

Safety Glasses: Eye protectors with sidepieces that fit over the ear.

Safety Rule: A positive rule requiring compliance by all employees concerned. Deviation from safety rules is not permitted and is subject to disciplinary action.

SCBA: Self-contained breathing apparatus respirator.

Secondary Compartment: A compartment containing voltages less than 600 volts.

Secondary Voltage: Any electrical circuit that normally operates at less than 600 volts.

SEI: Safety Equipment Institute.

Servicing and/or Maintenance: Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines and/or equipment that could expose the employee to the unexpected energization or start-up of equipment or release of hazardous energy. Examples are lubrication, cleaning, or un-jamming machines or equipment, and making adjustments or tool changes.

Shall: When the word “shall” appears in the wording of a rule, the rule is to be obeyed as written. (A mandatory requirement).

Shatterproof: The inability of an object to break apart or disintegrate.

Shield (Shield System): A structure that is able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shield structures can be permanent or portable and moved along as work progresses.

Shoring (Shoring System): A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the side of an excavation and which is designed to prevent cave-ins.

Should: When the word “should” appears in the wording of a rule, the rule is to be obeyed as written when reasonable or practical to do so. (An advisory requirement).

Side Shields: Sidepieces that are worn with safety glasses or goggles that prevent hazards from entering the eyes from the side.

Sloping (Sloping System): A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as soil type, environmental conditions of exposure, and application of surcharge loads.
Snap-Hook: A self-closing device with a keeper, latch, or other similar arrangement that will remain closed until manually opened. Such devices include self-closing, single-action, double-action, or double-locking snap-hooks.

SOP: Standard (or Standing) Operating Procedure.

Stability: The likelihood a material is to remain unchanged. Material is considered stable if it remains unchanged under normal conditions.

Stable Rock: Natural solid mineral material that can be excavated with vertical sides and which will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or side of the excavation is secured against caving in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Step Bolt: A bolt or rung attached at intervals along a structural member and used for foot placement during climbing or standing.

Stored Energy: Potential or residual energy that exists in an object that isn’t moving.

Strike Sensing System: A system with dual circuits to measure elevated electrical potential on the directional boring machine and current flow along the drilling string.

Substantial: A quality of Lockout and Tagout devices that means they can’t be removed without excessive force or unusual techniques such as bolt cutters or other metal cutting tools. Tagout devices and their means of attachment must be substantial enough to prevent inadvertent or accidental removal, with a minimum unlocking strength of at least 50 pounds and designed to be at least equivalent to a one-piece nylon cable tie tolerant of all environments.

Supervisor Or Employee-in-Charge: Any person, regardless of classification, who is directly in charge of a specific job or specific jobs. (Depending upon local classification, this person may be a leader, working supervisor, crew leader, acting crew leader, general supervisor, supervisor, or superintendent.) See Employee-in-Charge.

Suspension: The inner structure of a hard hat, consisting of the headband and straps, capable of absorbing and distributing impact experienced by a hit or blow.

Switch: A device for opening and closing or changing the connection of a circuit. In these rules, a switch is understood to be manually operable, unless otherwise stated.

Swivel: Joins a backreamer assembly to a conduit adapter, and permits the backreamer to rotate without turning the conduit that is being pulled in. It is also a device that can be placed between a pull line and a conductor being strung to allow the pull line and conductor to rotate.

System Operator: A qualified person designated to operate the system or its parts.
**Tagout Device**: A prominent warning device such as a tag and a means of attachment, which can be securely fastened to an energy isolating device according to established procedures. It informs employees not to use the energy isolating device and the equipment it controls until the Tagout device is removed.

**Tagout**: If a device is not capable of being locked out, a Tagout system can be used. The Tagout system must provide full employee protection as if a lock had been used. The Tagout device shall be attached at the same location, or as close as possible, that a Lockout device would have been attached.

**Tailgate Meeting**: See Job Briefing.

**Toe Cap**: Metal reinforcement added to the toes of safety shoes to prevent injuries.

**Toxic Substance**: A chemical or substance that may present an unreasonable risk of injury to health or the environment.

**Transferring**: The act of moving from one distinct object or location to another.

**Transitioning**: The act of moving from one location to another on equipment or a structure while going around or over an object.

**Transformer**: A device used to increase or decrease electric energy from one circuit to another.

**Underground Residential Distribution (URD)**: A general term that covers the necessary facilities to furnish underground service, generally to residential and commercial customers and usually through directly buried cable.

**Universal Precautions**: A method of work practices for infection control that treats all human blood and other potentially infectious material as capable of transmitting HIV, (HBV) Hepatitis and other bloodborne pathogens. Refer to the BWL Bloodborne Pathogen Exposure Control Program for specific procedures.

**Unsafe Conditions**: Any dangerous conditions, hazardous conditions, defective conditions, or unusual conditions that could be conducive to accidents.

**Vapor**: The gaseous phase of a substance.

**Vault**: An enclosure, above or below ground, which personnel may enter and which is used for the purpose of installing, operating, or maintaining equipment or cable.

**Vented Vault**: A vault that has provision for air changes using exhaust flue stacks and low-level air intakes operating on differentials of pressure and temperature providing for airflow, which precludes a hazardous atmosphere from developing.
Vinyl Chloride: A chemical compound, used in producing some plastics, that is believed to be carcinogenic.

Voltage: The effective (RMS) potential difference between any two conductors or between a conductor and ground. The voltage specified in this manual shall mean the maximum effective voltage to which the personnel or protective equipment may be subjected. Low voltage includes voltages up to 600 volts. High voltage shall mean voltages in excess of 600 volts.

Voltage of an Effectively Grounded Circuit: The voltage between any conductor and ground, unless otherwise indicated.

Voltage Limiter: A device used to detect potential differences between the directional boring unit and ground.

Warning Signs: Any sign or similar means of employee or public notification alerting to an actual or possible hazard. Included are “Danger” signs, “Caution” signs, traffic protection signs, instructional signs, and informational signs.

Worksite: The location on the structure or equipment where, after the worker has completed climbing (horizontally and vertically), the worker is in position to perform the assigned work or task.

Zero Mechanical State (ZMS): When no energy is coming into or is inside the equipment.
## APPENDIX A
### MIOSHA STANDARDS

Complete text of the standards can be found on the Michigan Department of Labor and Economic Growth internet web site [http://www.michigan.gov/cis](http://www.michigan.gov/cis) or contact Safety Department for assistance.

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• The Lansing Board of Water and Light’s Safety and Health Management System is composed of the following elements:
  o Management Commitment.
  o Employee Involvement.
  o Workplace Analysis.
  o Hazard Prevention and Control.
  o Safety and Health Training.

• MANAGEMENT COMMITMENT
  o Management at all levels shall demonstrate a strong, genuine, continuous, and personal commitment to safety.
  o Management’s leadership and commitment shall be evident in:
    ▪ Personal commitment to safety as a value built into each business priority.
    ▪ Acceptance of the merits of safety management such as, reduced amount and severity of injuries, reduced costs associated with injuries, increased employee morale, improved BWL public image, increased productivity, quality, and ultimately profitability.
    ▪ A clearly stated Safety and Health Policy that is communicated and understood by all employees.
    ▪ Defined safety program goals and corresponding objectives designed to meet those goals.
    ▪ Sufficient resources allocated to support the achievement of safety program goals and objectives.
    ▪ A system of accountability to ensure managers, supervisors, and employees accomplish their assigned safety responsibilities.
    ▪ Key indicators of safety performance are included in the corporate and departmental balanced scorecard.
    ▪ Periodic reviews of programs, projects, and activities to determine their effectiveness in achieving safety program goals and objectives.
• EMPLOYEE INVOLVEMENT
  o Employee involvement shall provide the means through which workers develop and express their own commitment to safety and health.
  o Employee involvement shall be evident in:
    ▪ Responsibility for safety and health is defined, shared and accepted at all levels in the organization.
    ▪ Employees are encouraged to report safety and health hazards.
    ▪ Active participation in daily tailgate (job briefing) meetings.
    ▪ Attendance and participation in departmental safety meetings.
    ▪ Attendance to safety and health training events.
    ▪ Participation in incident investigations.
    ▪ Participation in job safety analysis.
    ▪ Membership in department safety advisory committees.
    ▪ Membership in the BWL Safety Committee.

• WORKPLACE ANALYSIS
  o The BWL shall establish a hazard analysis program to identify existing and potential hazards, as well as conditions and operations in which changes might create hazards, using tools such as:
    ▪ Job safety analysis.
    ▪ Periodic area inspections.
    ▪ Risk assessments.
    ▪ Industrial hygiene exposure assessments.
    ▪ Incident investigations.
    ▪ Process hazard analysis.
    ▪ System safety reviews.
  o The BWL shall develop a hazard inventory which includes the following:
    ▪ Work environment: Chemical, physical, biological, and ergonomic hazards.
    ▪ Equipment and processes: Construction plans, fire prevention, emergency response, tool/equipment conditions, housekeeping, and machine and electrical safeguards.
- Employee work practices: Appropriate use of equipment, tools, machines, safety devices, lifting techniques, lock out/ tag out and personal protective equipment.

  - The BWL shall establish a reliable system of employee hazard reporting which includes:
    - A policy that encourages employees to report safety and health concerns.
    - Protection of reporting employees from any type of reprisal or harassment.
    - Timely investigation of the hazard and its corrective action.
    - Timely and appropriate responses to the reporting employee.
    - Tracking of required hazard correction.
    - Documentation in a record keeping system.

  - The BWL shall create a hazard ranking system based on hazard evaluation and risk assessment so the best method of control can be selected and implemented.
    - Hazards shall be categorized according to the risks they posed according to the probability of occurrence, severity of outcomes, and employee exposure.
    - Qualitative hazard probability estimations can be made through research, analysis and evaluation of historical safety data and expert opinion. Any rationale for assigning a hazard probability should be documented.
    - Appropriate definitions of hazard severity categories shall be established to set understandable qualitative measures for incidents that might occur if a hazard potential is identified.

- **HAZARD PREVENTION AND CONTROL**
  - Hazard control measures shall be applied to bring risk to an acceptable level when worker exposures are found to pose an unacceptable risk.
  - Hazard control should begin by eliminating hazards at the design or redesign stage. If this is not feasible then the following hierarchy of control measures shall be applied:
▪ Engineering controls should be used as the first and most reliable strategy to control a hazard. Examples of engineering controls are ventilation systems, machine guarding, sound enclosures, circuit breakers, platforms with guard railing, interlocks, etc.

▪ Administrative controls can be used to minimize worker exposure through policies, procedures, and rules when engineering controls are not feasible. Examples of administrative controls include standard operating procedures, preventive maintenance, housekeeping programs, equipment inspection programs, worker rotation, employee training, confined space program, Lockout/Tagout program, etc.

▪ Personal protective equipment (PPE) can be used as a supplementary control method when hazards cannot be engineered out and when administrative controls cannot provide sufficient protection. PPE should not be used as a substitute for engineering and/or administrative controls.

  o The BWL shall ensure that workplace modifications through design take the following issues into account:
    ▪ The relationship between the worker and the job through ergonomic design considerations.
    ▪ Relevant safety and health regulations and standards.
    ▪ Facility, workstation and machine design.
    ▪ Material selection.
    ▪ Proper material handling.
    ▪ Life safety and fire protection.
    ▪ Safety and health aspects of automated process.
    ▪ Preventative maintenance of equipment.
    ▪ Safe operating procedures.

  o The BWL shall develop operational safety and health programs that:
    ▪ Identify, evaluate, and control employee exposures to work-related hazards.
    ▪ Assure proper treatment, follow up, and return-to-work from work-related ailments and injuries.
    ▪ Manage and control external exposures that can put the organization at risk for potential liability such as:
• On-site contractors.
• Vendors.
• Public liability.
• Natural disasters.

- The BWL shall have an emergency action plan that focuses on:
  - All potential emergencies, including but not limited to:
    • Fire.
    • Natural disasters.
    • Industrial explosions.
    • Chemical releases or spills.
    • Medical emergencies.
    • Workplace aggression and violence.
    • Terrorism.
      - Evacuation procedures.
      - Appropriate alarms.
      - Emergency response equipment.
      - Coordination with local responders and emergency operations center.
      - Disaster recovery.
      - Media communication.
      - Employee training.

- An audit program shall be developed with the participation and input from those at all levels of the organization, and should include the following:
  - Standards and procedures for conducting the audits.
  - Program review of one or all of the safety management system elements including: Management commitment; hazard recognition, evaluation and control; operational safety programs, employee involvement, and health and safety training.
  - A proposed audit schedule.

- A continuous improvement plan shall be created and executed by BWL management, safety department, safety committee, and department safety advisory committees, using the results from the periodic audits and assessments, to include:
  - Measurable improvement goals, strategies and tactics.
  - Goal implementation timetable.
- Review of the measurements effectiveness and process adjustment to facilitate constant improvement.

- **SAFETY AND HEALTH TRAINING**
  - Safety and health training shall provide the mechanism for employees to understand safety and health hazards, and how to protect themselves and others.
  - Safety and health training shall be conducted for new and current employees:
    - When employee’s responsibilities or job duties change.
    - When employees show a deficiency in knowledge of a safety rule or procedure.
    - When new hazards are identified and new controls are implemented.
    - When required by a specific standard, equipment or procedure.
  - Safety and health training can be performed in classroom, online, on-the-job training, one-on-one training with co-workers and supervisors, or using a Learning Management System.
  - Safety and health training programs shall be developed using the guidelines established by the BWL Organizational Development and Training department.
  - New employee basic safety orientation shall be conducted as soon as possible and prior to employee assignment of work duties.
  - New employee basic safety orientation shall cover a discussion of topics, including, but not limited to, the following:
    - BWL corporate values - Reliability, environmental stewardship, affordability, customer service, and health and safety.
    - BWL Safety and Health Policy.
    - BWL safety organizational structure.
    - BWL Emergency Action Guidelines
    - Classes of fires and fire extinguisher use.
    - Injury, near miss and hazard reporting and investigation process.
    - Hazard identification and control.
    - Personal protective equipment.
    - Principles for the reduction of human error.
• Hazard communication.
• Electrical safety and control of energy sources.
• General ergonomic principles.
• Specific safety training related to the employee duties or department.

  o Departmental safety and health training shall include topics including but not limited to the following:
    • Fitness for duty.
    • Warning signs and labels.
    • Emergency evacuations.
    • Fire safety.
    • Location of fire extinguishers, first-aid kits, and automated external defibrillators.
    • Blood-borne pathogens exposure control program.
    • Workplace ergonomics.
    • Back safety.
    • Office safety.
    • Hazard communication.
    • Personal protective equipment.
    • Respiratory protection.
    • Hearing conservation.
    • Fall protection.
    • Hazardous waste operation.
    • Electrical Safety.
    • Control of hazardous energy (LOTO).
    • Permit required confined spaces.
    • Excavation safety.
    • Tool safety.
    • Welding safety.
    • Forklifts.
    • Aerial lifts.
    • Cranes.
    • Other specialized safety training as mandated by OSHA/MIOSHA regulations or equipment manufacturer.
APPENDIX C
SAFETY AND HEALTH POLICY

The Lansing Board of Water & Light recognizes its responsibility for providing a safe working environment for its employees, contractors, customers and the general public. To that end, the safety and health program shall create an understanding that safety is not a priority that can be changed, but a value associated with every priority. This responsibility can only be met by providing a comprehensive safety program that will:

- Comply with all governmental rules and regulations.
- Promote safety awareness among all employees through training.
- Provide safety equipment necessary for the safe completion of a task.
- Develop and implement a continual improvement process to identify and eliminate unsafe conditions or acts.

We further recognize that safety is beneficial to the employee, the employee's family, the customer and the community. Therefore, it is our commitment to provide a safe and healthy work place and to ensure that safety is never secondary to any other business priority. It is also understood that anyone providing services to the Board of Water & Light will be held to the same high standards regarding the safety and health of their employees.

It is the responsibility of each employee to work safely for their benefit and their co-workers. This responsibility includes following the safety rules and planning each work activity utilizing risk assessment, good judgment, skills and a sincere dedication to safe work practices.

It is the responsibility of each employee in a leadership position to actively support the Board of Water & Light’s overall safety and health program. Included with this responsibility is proper planning, monitoring and enforcing the use of safe working practices and safety rules.

To be successful all employees must develop proper attitudes toward injury and illness prevention. This requires cooperation in all safety and health matters, not only between supervisor and employee, but also between each employee and their co-workers. Only through such a cooperative effort can this safety and health program be established and preserved.
# APPENDIX D
## SAFETY MANUAL ACTIVITY LOG

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APPENDIX E
ELECTRONIC NAVIGATION HELP

Instructions for use with Adobe Reader X

Viewing this manual online provides the advantage of jumping around via bookmarks and hyperlinks. These are tips for improving your navigation experience with the Safety Manual:

To enable the find (search) function for a word or phrase:

- *The keyboard shortcut to bring up a search window is Ctrl + f*

  OR

- Click **view** at the top of the document viewer window
- Select **show/hide**
- Select **toolbar items**
- Select **edit** and (if not already checked) click on **find**
- **Find** will now appear as a magnifying glass toward the top of the viewer window. Click it to enter your word or phrase. Continue to hit enter until the desired selection has been found.

To enable the **previous**/**next** buttons for returning to pages already visited:

- *The keyboard shortcuts for previous and next are:*
  - **Previous:** *Alt + left arrow*
  - **Next:** *Alt + right arrow*

  OR

- Click **view** at the top of the document viewer window
- Select **show/hide**
- Select **toolbar items**
- Select **page navigation** and (if not already checked) click on **previous** and **next**
- **Previous** and **next** will appear as blue left-pointing and right-pointing arrows and function like the back and forward arrows in a web browser.

Other points of reference:

- Use the + and – buttons to zoom in and out to your preferred view
- Underlined items are hyperlinks and will take you to a section where those items are further described
- There is a RETURN TO TABLE OF CONTENTS option on the first page of every section (100, 200, DEFINITIONS, etc.)
- This document has selectable text, meaning partial or complete rules and sections can be copied and pasted into other documents
- With your browser window already open, click **here** to visit Safety Department on the intranet for more information on any of the programs referred to in this Manual
- Suggestions for revisions to any portion of this Manual should be routed through your department’s Safety Advisory Committee for submission to the BWL Safety Committee
- Please call 702-6576 with questions or for additional assistance