



In addition to the ABM Safety & Health Manual and the ABM Injury & Illness Prevention Program, this addendum applies to all of ABM Technical divisions including but not limited to:

ABM Building & Energy Solutions / Services

ABM Electrical Power Solutions / Services

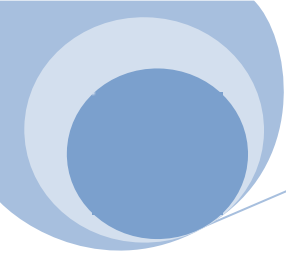
ABM Electrical & Lighting Solutions / Services

ABM Energy

ABM Engineering

ABM Performance Solutions

**ThinkSafe**<sup>™</sup>  
*People. Materials. Environment.*



# ABM Technical Addendum

## Management's Commitment to Safety



ABM Technical Solutions is committed to excellence in workplace safety. We as a company believe that there is not a job or activity so important that it cannot be accomplished in a safe manner. Safety is one of the highest corporate values and it is our goal that all employees work accident and injury free every day. Each employee is responsible for their own safety and the safety of fellow employees, our contractors and the public. To accomplish this, ABM Technical Solutions will:

- ✓ Work to achieve zero accidents and injuries in all aspects of our business operation.
- ✓ Conduct all activities responsibly and in a manner that promotes the health and safety of our employees, contractors, customers, and the communities in which we do business.
- ✓ Assess our safety performance on a regular basis, and at all levels of the Company.
- ✓ Provide appropriate resources to implement and maintain safety programs and incorporate safety into the business planning process.
- ✓ Foster employee wellness through education and employee involvement.
- ✓ Promote open and proactive communications relative to workplace safety with our employees, contractors, regulatory agencies, public officials, and customers.
- ✓ Comply with applicable federal, state, and local occupational safety and health laws and regulations in the communities in which we do business.
- ✓ Work with suppliers and contractors to ensure that the products and services that they provide meet our safety standards.

Creating a work environment that fosters continuous improvement in the safety of our employees, contractors, customers and communities is a critical element of our business success. All employees have a responsibility to follow all safety protocol, utilize PPE and foster a safe working environment for fellow employees, suppliers and contractors.

Our objective is to provide a clean, safe and healthy working environment for all employees. It is our intention to comply with all safety and health standards that are enforced by local, state and federal authorities. To that end, we will provide engineering controls, administrative controls, personal protective equipment and training to abate and reduce exposure to hazards and prevent injury and illness. We have developed policies, rules, and procedures, which will contribute to the safety of all employees. We expect all employees to work according to good safe practices as posted, instructed, and discussed.

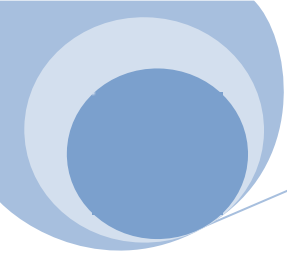
Employees will contribute to the company safety program by following all safety rules, bringing unsafe conditions to the attention of management and recommending actions to improve the effectiveness of the program.

Job Leaders should request that employees observe and follow the regulations that have been put in place to help ensure the safe conduct of work. Leaders should take such action, if necessary, to obtain compliance.

|  |  |                   |
|--|--|-------------------|
|  |  | February 13, 2023 |
| Mark Hawkinson   President ABM Technical Solutions |  | Date              |

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# ABM Technical Addendum

## Fire Prevention & Extinguisher Program



### 1. Purpose

The purpose of this program is to provide fire extinguisher procedures to ensure equipment is operable and employees have the knowledge to safely operate in case of a fire incident. Employees are authorized to use a customer's fire extinguisher only if specifically requested or required by contract.

### 2. Scope

Applies to all designated ABM employees. Employees should not handle fire extinguishers unless specifically authorized by the customer and the facility services' contract.

### 3. Responsibilities

The customer is responsible for developing procedures for the use and care of fire extinguishers and for developing a training program for the proper use of these devices. The operations manager is responsible for making the employees available for the training provided at the location. The supervisors are responsible for enforcing the provisions of this program. All employees are responsible for following these provisions.

### 4. Procedure

#### *Selection and Distribution*

Portable fire extinguishers shall be identified by ABM customers for employee use. They must be selected and distributed based on the classes of anticipated workplace fires and on the size and degree of the hazard which would affect the extinguishers' use. Fire extinguishers used by maybe one or more of the four classes of fires:

- Class A Fire Extinguisher. Use on ordinary combustibles or fibrous material, such as wood, paper, cloth, rubber and some plastics. Travel distance for employees to any extinguisher is 75 feet (22.9 m) or less.
- Class B Fire Extinguisher. Use on flammable or combustible liquids such as gasoline, kerosene, paint, paint thinners and propane. Travel distance from the Class B hazard area to any extinguisher is 50 feet (15.2 m) or less.
- Class C Fire Extinguisher. Use on energized electrical equipment, such as appliances, switches, panel boxes and power tools. Travel distance from the Class C hazard area to any extinguishing agent is 50 feet (15.2 m) or less.
- Class D Fire Extinguisher. Use on combustible metals, such as magnesium, titanium, potassium, and sodium. Travel distance from the combustible metal working area to any extinguishing agent is 75 feet (22.9 m) or less.

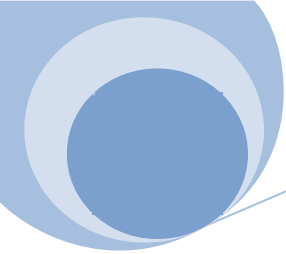
### 5. Labeling of Fire Extinguishers

Fire extinguishers are to be mounted in easily accessible locations that are indicated by a sign that reads "Fire Extinguisher". Fire extinguishers are to be located by the ABM customer so that no employee will ever be more than 75 feet from an extinguisher. No equipment, boxes or product may be placed (even temporarily) in the way of a fire extinguisher. Each fire extinguisher will be assigned a unique number by the customer or owner of the extinguisher.

### 6. Maintenance

All fire extinguishers shall be mounted no higher and no lower than four (4) feet from the floor. All fire extinguishers shall be maintained as follows:

- Numbered to identify their proper location
- Fully charged and in operable condition
- Clean and free of defects
- Readily accessible at all times



# ABM Technical Addendum

## Fire Prevention & Extinguisher Program



### **7. Inspection, Maintenance and Testing**

All fire extinguishers are to be inspected by ABM's customer monthly. Unless trained and qualified to do so by a certified trainer, no ABM employee shall inspect and/or service a fire extinguisher. This equipment is to be inspected and serviced annually by certified personnel from a fire extinguisher dealer. Fire extinguishers are to be inspected and re-charged by certified personnel after any use.

Any fire extinguisher that shows a loss of pressure during the monthly inspection will be inspected and re-charged by certified personnel. Completed fire extinguisher inspection logs will be maintained in the safety files and become a part of the safety records. They are to be maintained for five years.

### **8. Use (Informational Purposes Only)**

In the event of a fire, an individual will get the nearest fire extinguisher and use it to attempt to put the fire out. All other individuals in the immediate area will prepare to evacuate if needed. All other individuals in the building need to be advised that a fire is in progress.

The individual attempting to extinguish the fire will break the safety seal on the handle and pull the pin. He or she will then aim the extinguisher at the base of the fire and discharge it with a sweeping motion from side to side continuing until the fire is out or the extinguisher is emptied.

Remember that a standard fire extinguisher will be emptied in about 10 to 15 seconds. If the fire is not out when the extinguisher has been completely discharged, the employees must evacuate the area.

### **9. Training and Education**

The purpose of this section is to establish training procedures, which are necessary for the proper use and understanding of a fire extinguisher and incipient stage firefighting. Training will occur prior to initial assignment and at least annually thereafter. All training will be provided by a company or local fire department personnel that will certify ABM employees in the proper use and discharge of fire extinguishers. ABM is not able to certify its own employees.

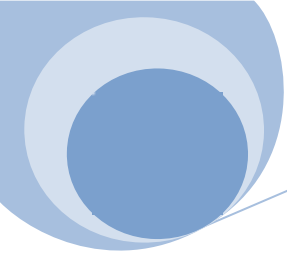
On even numbered years, this training certification will be conducted by a member of the local fire department (where possible) and will include "live fire" hands-on use of the extinguisher. On odd number years, this training will be conducted by the safety manager and will include a demonstration of the use of fire extinguisher, without actually discharging the unit. New employees will be given the even-number year training upon hire.

#### *Initial Training Outline*

- General principles of a fire; hazards employed with an incipient stage fire(s).
- When to "back off" (evacuate) of an incipient stage fire(s).
- General fire principles of a fire extinguisher.
- Hazards employed with the use of a fire extinguisher
- Use of a fire extinguisher.

#### *Retraining*

Retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary. Retraining shall be provided for all authorized and affected employees whenever there is:



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## Fire Prevention & Extinguisher Program



- A change in job assignment
- The customer has reason to believe that there are deviations from or inadequacies in the employee's knowledge of use of fire extinguishers or fire prevention procedures.

### *Training Documentation*

- All training will be documented and each employee's understanding will be subject to a "hands-on" test.
- Documentation will consist of; as a minimum, the employee's name, the trainer's name, the date of the training, and an outline of the training provided.

### **How to Prevent Fires**

- Smoke only in designated areas. Handle and dispose of cigarettes properly. Empty ashtrays only when the smoking materials are cold.
- Use combustible or flammable materials properly. Follow the instructions on the container and use only as directed.
- Store flammable or combustible materials properly. Do not store materials near hot sources, open flames, or spark-producing hazards.
- Dispose of flammable and combustible waste properly. Dispose of contaminated rags, cardboard, etc. only in designated containers.
- Make sure electrical equipment is grounded. Be alert to electrical defects in equipment. Exposed wires, overheating motors, and faulty switches are significant fire hazards.
- Never attempt to repair a piece of equipment unless you are specifically trained, qualified, and authorized to do so.
- Follow safe operating guidelines to prevent the overloading of machine capacity. Keeping equipment well-maintained, correctly lubricated and clean will also help prevent overheating.
- Practice good housekeeping at all times. Maintain an orderly work environment and keep fire doors, stairways, aisles, and exits clear.
- Be careful when cutting, welding, and grinding. These operations can ignite combustible and flammable materials that may be stored nearby

# ABM Technical Addendum

## Fall Protection Program

### 1. Policy

ABM employees working at heights greater than four feet shall be protected from falling by the use of appropriate and compliant systems such as guardrails and fall arrest systems.

### 2. Purpose

The program and procedures described in this document establish the requirements for management of a fall protection program where it is recognized that there is a potential for falls greater than four feet. These requirements include the identification of fall hazards, elimination of the hazards, when possible, and the provision of fall protection and training when the hazard cannot be eliminated.

### 3. Scope

This program applies to all ABM employees conducting business and/or providing services in buildings or structures managed and or operated on behalf of ABM.

The program is specific to OSHA fall protection guidelines for the general industry, which affects employees working at heights greater than 4 feet. While the construction industry guidelines affect employees working at heights greater than 6 feet, most of the equipment selections, use, maintenance and inspection requirements are the same. If you are working on a construction site or performing a task that falls under the construction industry, be sure you understand and follow all fall protection requirements for the construction industry.

### 4. Responsibilities

#### Manager/Supervisor

- Identify fall hazards
- Eliminate fall hazards when possible
- Ensure fall protection devices are provided, properly installed and used by employees
- Ensure employees are following safe work practices

#### Employees

- Inspect fall protection equipment before each use and remove defective equipment from use immediately
- Exercise constant awareness of and respect for fall hazards and properly use fall protection devices as required
- Will not override or disable any fall protection device

### 5. Definitions

**Anchorage** - a secure point of attachment for lifelines, lanyards or shock absorber devices.

**Body harnesses** - Straps secured about the employee that will distribute the fall stopping forces over the body. The body harness has a means for attaching it to other components of a personal fall arrest system.

**Fall Arrest System** – A system used to arrest a person in a fall from a working level and that minimizes the potential for compounding injury. Fall arrest systems consist of the following minimum components:

- Rated anchorage point of at least 5,000 pounds
- Lanyard that is shock absorbing or self-retracting
- Connecting hardware (double-locking snap hooks, carabineers, D-rings)
- Full body harness (body belt strictly prohibited)

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## Fall Protection Program

**Fall Restraint System** - An approved fall protection device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level. Fall restraint systems consist of the following minimum components:

- Rated anchorage point with a capacity at least four times the intended load or 800 pounds, whichever is greater
- Lanyard (length must be limited to prevent access to edges where fall could occur)
- Connecting hardware (double-locking snaphooks, carabiners, D-rings)
- Full body harness (body belt strictly prohibited)

**Lanyard** - a flexible line of rope, wire rope or strap that has a connector at each end for connecting the body harness to a shock absorbing device, lifeline or anchorage.

**Lifeline** - a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline) or for connection to anchorage at both ends to stretch horizontally (horizontal lifeline).

**Personal fall arrest system** - a system used to stop an employee's fall consisting of an anchorage, connectors and a body harness and may include a lanyard, a shock absorbing device, a lifeline or a suitable combination of these.

**Personal flotation device (PFD)** - a life vest, life preserver or buoy ring that is flame resistant and capable of supporting a person.

**Shock absorbing device** - any mechanism such as a rope grab, rip-stitch lanyard, specially woven lanyard, tearing or deforming lanyard and others, which serves to dissipate energy during a fall. These mechanisms will also arrest and limit the energy imposed on the employee as he is stopped.

**Snaphook** - a connector comprised of a hook-shaped member with a normally closed keeper or similar arrangement that may be opened to permit the hook to receive an object and when released, automatically closes to retain the object.

## 6. PROGRAM REQUIREMENTS

All work performed at four (4) feet or more above grade requires a personal fall arrest system except when working on the following systems:

- Permanent platforms enclosed by proper handrails and midrails
- Temporary scaffolding and walking surfaces protected by proper handrails and midrails
- Fixed, caged ladders
- Portable ladders

### 6.1. Identification and Assessment of Fall Hazards

Fall hazards shall be identified through the completion of job hazard analyses for each of the jobs/tasks that involve working at heights greater than four feet. ABM employees will not perform work where safety nets are required.

A Qualified Person, who is knowledgeable in identifying fall hazards or dangerous conditions requiring the installation of a fall protection system, shall conduct the job hazard analyses, and recommend the correct type of fall protection device required for the hazardous condition.

1. If work at heights is unavoidable, secure the elevated work area with a passive fall prevention barrier system,



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## Fall Protection Program



such as guardrails.

2. When a fall prevention barrier system is not feasible because of the physical characteristics of the work environment or the infrequency of access, use an approved fall restraint system.
3. If no other option is feasible, a properly engineered and approved fall arrest system can be used in conjunction with a rescue plan.
4. A site specific fall protection plan shall be prepared by a qualified person for the specified contract work.

In addition, when conventional fall protection is not used, controlled access zones must be identified and classified along with the posting of appropriate signage.

### 6.1.1. Openings and Holes

All floor, skylight, ramp, leading edge, platform, wall openings and holes shall be properly guarded through the installation of standard railing (guardrail and midrail), toe boards, hinged doors, covers, gates, etc. on all exposed sides to prevent persons and materials from falling through openings or holes.

When fall prevention, such as railings, gates or doors, is not possible, fall protection measures must be used.

### 6.1.2. Stairways

Stairways and stair platforms shall be properly protected with standard railings or handrails on exposed sides.

### 6.1.3. Scaffolding

Exposed sides of scaffolds must have suitable guardrails and/or toe boards in place. Refer to the Scaffold Safety Program for requirements regarding use of these devices.

### 6.1.4. Rooftops

#### A. Low Slope Roofs

Employees are not required to use fall protection equipment while on a rooftop so long as their purpose for being on the rooftop is limited to inspection, investigation, or assessment of job hazards prior to commencement of construction or other maintenance/repair activities.

When construction, maintenance or repair activities are underway, fall protection measures must be taken by any employee who might go to the roof, irrespective of the amount of time spent on the roof, to observe or inspect work. This will include one or a combination of (1) personal fall arrest system, (2) a warning line (i.e., ropes, wires or chains, and supporting stanchions with at least 500 pounds tensile strength), and (3) a safety monitor.

When a safety monitor is utilized he/she shall:

- Be competent in the recognition of fall hazards,
- Be capable of warning workers of fall hazard dangers,
- Detect unsafe work practices,
- Work on the same surface as the workers and maintain visual contact of with all employees,
- Be close enough to the work operations to communicate orally with the workers, and have no other duties that will interfere or distract from the monitoring function,
- If the roof is equal to or less than 50 feet in width, a safety monitor may be used without a warning line.

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The use of a safety monitor is not necessary when (1) a warning line is 15 or more feet from the edge of the roof, (2) the warning line meets OSHA requirements, (3) no work or work related activity takes place in the area between the warning line and the edge of the roof, and (4) employees are aware that they must not go past the warning line.

### B. Steep Roofs

Any employee working on a steep roof with unprotected sides and edges 6 feet or more above the lower levels shall be protected by either guardrail systems with toe boards or a personal fall arrest system.

#### 6.1.5. Powered Elevated Platforms

Personal fall arrests systems, used to arrest a free fall as opposed to holding the worker in place, shall be used by employees working on articulating booms at all times, and powered elevated work platforms with unprotected openings, and shall be attached at the anchor point determined by the manufacturer of the platform. Refer to section on Powered Elevated Platform Program for requirements regarding use of these devices.

### 6.2. Equipment Selection, Use, Maintenance and Inspection

#### 6.2.1. Selection

- All safety equipment will meet required ANSI, ASTM and OSHA specifications and be inspected as per program requirements.
- Safety harnesses or lanyards shall be a minimum of ½-inch nylon or equivalent with a nominal breaking strength of 6,000 pounds.
- Safety harnesses must be full body harnesses. Body belts are strictly prohibited.
- Lanyards which are the appropriate length to prevent falls (fall restraint) or limit the length of the fall to prevent employee from reaching the level below (fall arrest).
- Replacement lanyards shall have a locking snap hook on both ends.
- Lifelines shall be a minimum of 3/4-inch manila or equivalent with a maximum breaking strength of 6,000 pounds.
- Personal fall arrest systems shall limit the maximum arresting force on an employee to 1800 pounds.
- Following are requirements for horizontal (static) anchor lines:
  - ❖ Steel cables are recommended for horizontal (static) anchor lines.
  - ❖ Steel cables must have a minimum breaking strength of 6,000 pounds or five times the live load, whichever is greater.
  - ❖ A qualified individual must oversee installation.
  - ❖ The minimum diameter for steel cable static lines is 3/8 inches.
  - ❖ Turnbuckles shall be used to keep static lines taut.

**NOTE:** When using a fall arrest system, the fall distance calculation must account for the length of lanyard, connecting hardware, deceleration distance, deployment of shock absorbers, the height of the person wearing the equipment (or the height of the D-ring attached to the back of the harness), one foot of slack in the harness, the position of the anchorage point, lanyard or rope elongation, and a safety factor. A competent person must perform the fall distance calculation, or at a minimum verify that it was performed properly if calculated by someone else.

#### 6.2.2. Use

- Facility assigned employees using fall restraint or fall arrest equipment will work in teams of two or more.
- Lone workers using fall restraints or fall arrest equipment must be sufficiently experienced and understand the proper use of the required equipment.

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## Fall Protection Program

- A safety harness must be worn at all times while working four (4) or more feet above grade unless other adequate protection against falling is provided.
- Personal fall arrest systems shall be rigged in a manner that an employee can NOT free fall more than 4 feet or contact any lower level.
- Lanyards shall be attached above the point of operation and moved during work as necessary to ensure that the attachment point will not allow the harness wearer to reach the lower level before stopping the fall.
- All equipment should be used according to the manufacturer's operating manual.
- Never alter or attempt to repair harnesses, lanyards, or snaphooks.

### 6.2.3. Maintenance

- No repair of safety harnesses and lanyards is allowed unless performed and guaranteed by the manufacturer.
- Equipment shall be protected against being cut or abraded and not pass over sharp edges without padding or be dragged over concrete or rough surfaces.
- Equipment shall be thoroughly dried after becoming wet. Deterioration is hastened by leaving the fibers wet.
- Equipment shall be stored on hooks in clean, dry areas and shall not be exposed to corrosive chemicals. If exposed to corrosive chemicals, it shall be removed from service.

### 6.2.4. Inspection

- Body harnesses, lanyards, shock absorbing devices and lifelines shall be inspected annually and before use each day to determine that the equipment is in safe working condition and worn, damaged or defective fall protection equipment shall be removed from use immediately.
- The following defects, as a minimum, are cause for destruction of the equipment:
  - ❖ Cracked, dry or rotten leather.
  - ❖ Nylon or cords that have worn thin.
  - ❖ Cuts or worn places deep enough to weaken the strap or belt.
  - ❖ Broken stitches at buckles, D-rings or snaps.
  - ❖ A snap with weak springs behind the tongue or defective tongues that have been bent or sprung.
  - ❖ Loose tongues in buckles.
  - ❖ Cracked, bent or heavily worn buckles, D-rings or snaps.
  - ❖ Other wear, damage or defect that could affect the protection afforded by the assembly.

### 6.3. Rescue Plans and Emergency Response

In the event of an emergency, ABM site administration shall implement an effective rescue plan to provide for prompt rescue of employees in the event of a fall or shall assure the employees are able to rescue themselves. A written plan, prepared in advance, facilitates the training of rescue personnel by increasing their familiarity with specific areas difficult to access.

## 7. TRAINING REQUIREMENTS

Initial training on the safe use and care of fall protection devices, including rescue procedures when fall arrest equipment is used, shall be provided to any employee required to work at heights. Retraining shall be provided on a regular schedule, as well as when a change in workplace hazards occurs, the type of fall protection being used is changed, and/or if the employee's knowledge is inadequate for the task.

Employee training will consist of, but not limited to:

- When fall protection is required.
- What makes up proper fall protection system?

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## Fall Protection Program

- How to properly don personal fall protection items.
- ❖ **Harnesses**
  - Body harnesses will be adjusted to fit the chest and under the arms and legs snugly before each use.
  - Wear only harnesses that fit properly.
  - Belts used to secure the harness to your legs must fit snugly and pass through both sides of the buckle.
  - Position the “D” ring in the center of your back between your shoulder blades. The back “D” ring is the attachment point for the lanyard.
- ❖ **Lanyards**
  - Attach you lanyard as high above your head as possible as to reduce fall distance.
  - Never tie a knot in a lanyard. This can reduce its strength by 50%.
  - Use only approved lanyards. Do not use substitutes for lanyards such as wire or manila rope.
  - Protect lanyards from sharp edges to reduce possibility of ripping or tearing.
  - Damaged lanyards should be removed from service immediately.
- ❖ **Snaphooks**
  - Snaphooks must be equipped with a double-lock mechanism that requires two movements to open the snaphook.
    - When released the snaphook must return to the closed position.
    - Never connect two snaphooks into one “D” ring or connect snaphooks together.
    - Snaphooks should be positioned vertically when attached to an anchorage point.
  - How to care for and properly maintain personal fall protection equipment.
  - How to properly inspect person fall protection system components.

### 8. RECORD KEEPING REQUIREMENTS

All records documenting employee training on the elements of this program will be maintained at the site.

#### 8.1. Incident Investigations

Any and all incidents and or near miss events that occur within this program will be formally investigated. All equipment involved will be removed from service and tagged “DO NOT USE”.

The Building and Energy Solutions Safety Manager will be notified immediately as to any incident or near miss covered by this program.

All investigative documentation, equipment and other materials pertinent to the investigation will then be forwarded to the Building and Energy Solutions Safety Manager for review.

### 9. REFERENCES

29 CFR 1910.23: Guarding Floor and Wall Openings and Holes.

29 CFR 1910.66: Powered Platforms Manlifts, and Vehicle Mounted Work Platforms –

ABM Job Hazard Analysis Program

ABM Powered Elevated Platform Program

### 10. ATTACHMENTS

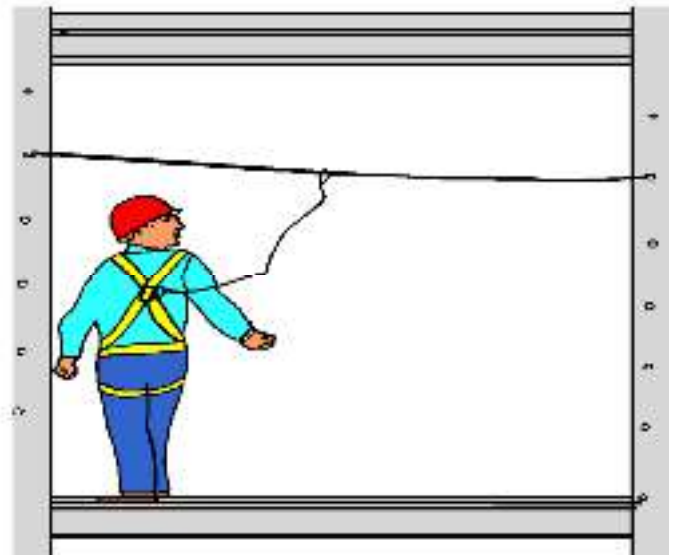
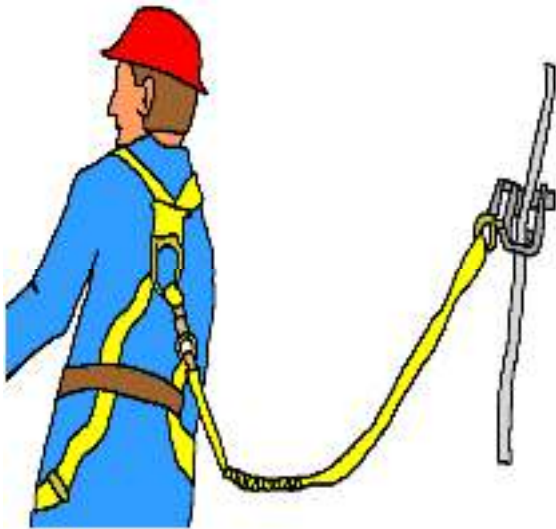
Attachment 1: Examples of Body Harness and Lanyard

Attachment 2: Harness and Lanyard Inspection Procedures

# ABM Technical Addendum

## Fall Protection Program

### Attachment 1 Examples of Body Harness and Lanyard









# ABM Technical Addendum

## Fall Protection Program

### Attachment 2 Harness and Lanyard Inspection Procedures

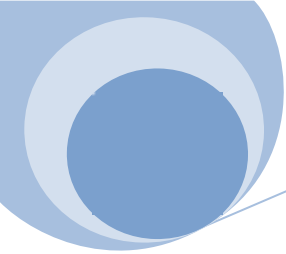
#### HARNESS INSPECTION

To inspect your harness, perform the following procedures for all harness straps

|   |   |  |
|---|---|--|
| 1 |    | <p><b>Webbing</b></p> <p>Grasp the webbing with your hands 6 to 8 inches apart. Bend the webbing in an inverted “U” as shown. The surface tension resulting makes damaged fibers or cuts easier to see. Follow this procedure the entire length of the webbing, inspecting both sides of each strap. Watch for frayed edges, broken fibers, pulled stitches, cuts, burns, and chemical damage.</p> |
| 2 |    | <p><b>D-Rings/Back Pads</b></p> <p>Check D-rings for distortion, cracks, breaks, and rough or sharp edges. The D-ring should pivot freely. D-ring back pads should also be inspected for damage.</p>   |
| 3 |   | <p><b>Attachment of Buckles</b></p> <p>Attachments of buckles and D-rings should be given special attention. Note any unusual wear, frayed or cut fibers, or distortion of the buckles or D-rings.</p>   |
| 4 |  | <p><b>Tongue/Grommets</b></p> <p>The tongue receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. Webbing should not have additional punched holes.</p>  |
| 5 |  | <p><b>Tongue Buckle</b></p> <p>Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Roller should turn freely on frame. Check for distortion or sharp edges</p>   |
| 6 |  | <p><b>Friction and Mating Buckles</b></p> <p>Inspect the buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.</p>   |

#### VISUAL INDICATIONS OF DAMAGE TO WEBBING AND LANYARDS

|   |  |  |  |
|---|--|--|--|
| <p><b>Heat</b></p> <p>In excessive heat, nylon becomes brittle and has a shriveled brownish appearance. Fibers will break when flexed. Should not be exposed to temperatures above 180°F.</p> | <p><b>Chemical</b></p> <p>Change in color usually appearing as a brownish smear or smudge. Transverse cracks when bent over a mandrel. Loss of elasticity.</p> | <p><b>Molten Metal or Flame</b></p> <p>Webbing strands fuse together. Hard shiny spots, Hard and brittle feel.</p> | <p><b>Paint and Solvents</b></p> <p>Paint that penetrates and dries restricts movement of fibers. Drying agents and solvents in some paints cause chemical damage.</p> |
|---|--|--|--|




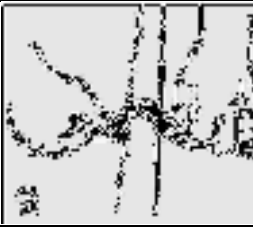




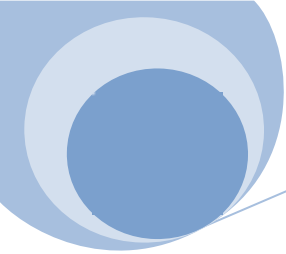
# ABM Technical Addendum

## Fall Protection Program

### LANYARD INSPECTION

When inspecting lanyards, begin at one end and work to the opposite end. Slowly rotate the lanyard so that the entire circumference is checked. Spliced ends require particular attention. Hardware should be examined under procedures detailed below, i.e., snaps, D-ring and thimbles.

|   |  |
|---|--|
|    | <p><b>Hardware</b><br/> <b>a. Snaps:</b><br/>         Inspect closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seat into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper. Keeper locks must prevent the keeper from opening when the keeper closes.</p>   |
|    | <p><b>Thimbles:</b> The thimble must be firmly seated in the eye of the splice, and the splice should have no loose or cut strands. The edges of the thimble must be free of sharp edges, distortion, or cracks.</p>   |
|   | <p><b>Steel Lanyard</b><br/>         While rotating the steel lanyard watch for cuts, frayed areas, or unusual wearing patterns on the wire. Broken strands will separate from the body of the lanyard.</p>  |
|  | <p><b>Web Lanyard</b><br/>         While bending webbing over a pipe or mandrel, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Examine the webbing for swelling, discoloration, cracks, charring are obvious signs of chemical or heat damage. Observe closely for any breaks in the stitching.</p>  |
|  | <p><b>Rope Lanyard</b><br/>         Rotation of the rope lanyard while inspecting from end-to-end will bring to light any fuzzy, worn, broken or cut fibers. Weakened areas from extreme loads will appear as a notice-able change in original diameter. The rope diameter should be uniform throughout, following a short break-in-period.</p>  |
|  | <p><b>Shock Absorber Pack</b><br/>         The outer portion of the pack should be examined for burn holes and tears. Stitching on areas where the pack is sewn to D-rings, belts, or lanyards should be examined for loose strands, rips, and deterioration.</p> <p><b>Shock-absorbing Lanyard</b><br/>         Shock-absorbing lanyards should be examined as a web lanyard (described in item 3 above). However, also look for the warning flag or signs of deployment. If the flag has been activated, remove this shock-absorbing lanyard from service.</p> |



# ABM Technical Addendum

## First Aid & Medical Emergency Policy



### 1. POLICY

All ABM locations shall have first aid supplies readily available for employees' use, and medical emergency procedures in place to respond to any injury or illness suffered by an employee or other person(s) on ABM premises.

### 2. RESPONSIBILITIES

Management shall ensure that appropriate first aid supplies are available to employees and that a medical emergency procedure is in place. Management shall post notice in an area frequented by employees of the location of first aid supplies, and of the names, addresses and telephone numbers of the local emergency room, walk in clinic, or physician care facility.

Employees shall report all work related injuries or illnesses to their supervisor. Employees shall know the location of first aid supplies and emergency equipment.

### 3. FIRST AID AND EMERGENCY EQUIPMENT/SUPPLIES

ABM locations shall be equipped with first aid supplies and emergency equipment to respond to an injury or illness. Appropriate first aid supplies and medical emergency equipment shall be determined based on the foreseeable exposures in the workplace. First aid kits must be inspected upon receipt from the supplier to ensure that the kit is complete with the appropriate supplies.

The contents of the first aid kit shall be placed in a weatherproof container with individual sealed packages for each type of item, and shall be checked by the employer before being sent out on each job and at least weekly on each job to ensure that the expended items are replaced.

First aid and emergency equipment include, but are not limited to, first aid kits, oxygen tanks, automated external defibrillators, and eye wash stations.

First aid supplies shall be readily available at the worksite. Such supplies shall, at a minimum, include a variety of bandages, compresses, gauze pads, antiseptic swabs, burn treatments, adhesive tape, and latex or similar gloves. Each of the items in the first aid kit shall be maintained in individually sealed packages and replaced as necessary. Supplies shall be stored in containers that adequately protect the contents from damage, deterioration, or contamination. The container shall be clearly marked, available when needed, and shall not be locked.

If an automated external defibrillator (AED) or oxygen tank is present at the worksite, there shall be employees who are trained in its proper use. AEDs shall be inspected and maintained regularly.

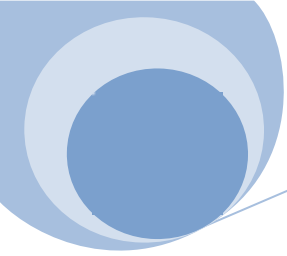
When injurious, corrosive materials are present, drenching and flushing facilities shall be made available in the work area for immediate emergency use. See Section on Emergency Washing Facilities.

Emergency vehicle kits shall be provided in all ABM vehicles. See Vehicle Safety.

### 4. ADMINISTERING FIRST AID

First aid may be provided in cases of minor injury or illness prior to the injured employee seeking professional medical attention. It is advisable that employees who provide first aid be trained in the proper administration of first aid and/or CPR.





# ABM Technical Addendum

## First Aid & Medical Emergency Policy



Personal protective equipment (PPE) shall be worn when it can reasonably be anticipated that a responding employee may be exposed to blood or other bodily fluids while rendering first aid. Such PPE includes gloves, gowns, face shields, masks, and eye protection. Refer to Blood borne Pathogens for further information on use of Universal Procedures when there is a potential for exposure to blood or other bodily fluids.

### 5. MEDICAL EMERGENCY

In the case of a serious medical emergency, professional responders shall be called. All work sites shall be within reach of a hospital, infirmary, or clinic.

For those locations which operate after normal business hours, 24/7 emergency response facilities shall be identified.

A procedure shall be developed to ensure the rapid provision of emergency medical services to injured employees. At a minimum, the plan must direct the responder to 911, and contain the emergency telephone number of an ambulance service should 911 not respond.

### 6. ACCIDENT REPORTING

All injuries and illnesses shall be reported to the supervisor as soon as possible, and, at most, within one business day of the incident.

### 7. EMPLOYEE TRAINING

Employees shall be informed of the location of first aid and emergency supplies. Employees shall be informed of the location of emergency facilities available and the procedure for reporting and handling a first aid or medical emergency.

Initial and refresher training for all ABM employees shall be conducted to ensure that all employees understand the procedures should an injury or illness occur in the workplace. Training must be site specific. In the absence of an infirmary, clinic, or hospital, in near proximity (3-4 minutes) to the workplace, which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Training shall be equal to that of the American Red Cross or Mining Enforcement and Safety Administration.

### 8. RECORDS

All training and equipment inspection and maintenance records shall be retained at the work site. All employees that hold current First Aid certification (IE. American Red Cross, etc.), shall have a copy of their certification in their respective employee file.

### 9. REFERENCES

Refer to the sections on [Emergency Action Plan](#) and [Fire Prevention Plan](#) for more information.

[29 CFR 1910.151](#) Federal Regulations on Medical Services and First Aid.

[Z308.1-2003](#) ANSI Standard on First Aid Kit requirements may be purchased from the ISEA.

[OSHA](#) interpretation letter.

Summary of Standard requirements

# ABM Technical Addendum

## Drivers Safety Program



### 1. Purpose

The purpose of this procedure is to establish program requirements for all employees using Company vehicles while conducting Company business within the course of their employment. The Company considers the use of authorized company vehicles or leased vehicles while conducting Company business as part of our work environment.

### 2. Scope

The Company is committed to promoting responsible employee behavior and appropriate levels of safety awareness as part of its Company Driver Safety Program. This Program applies to all employees who operate company owned, company leased or company authorized vehicles as part of their job requirement. All Employees are expected to operate their vehicle safely. The Company Driver Safety Program requires the full cooperation of each driver to adhere to these requirements.

### 3. Responsibility

The Company Chairman/President or his designate is responsible for promoting the Company Driver Safety Program. Management personnel are responsible for the successful implementation and ongoing execution of the elements of this Program. Authorized drivers are responsible for following and maintaining the policies and procedures set forth in this requirement.

#### **Company Chairman/President, Sr. VP of Operations (or designee):**

- Promote and direct the Company Driver Safety Program.

#### **General Manager (or designee):**

- Implement and direct the Company Driver Safety Program within their areas of responsibility.
- Promote and ensure compliance with the Program.
- Provide assistance and resources necessary to implement and maintain the Program.
- Investigate, document and report accidents and violations involving company vehicles in a timely manner.
- Direct requirements for driver safety training (internal or external) in accordance with this Program.
- Ensure all authorized company vehicle drivers comply with this Program.

#### **Safety Manager/Insurance Claims Coordinator:**

- Promote and ensure compliance with the Company Driver Safety Program.
- Evaluate and review all company vehicle accident reports.
- Provide periodic reports of losses for review.
- Maintain appropriate records.
- Evaluate the Program, make recommendations for improvement and provide updates to required personnel.
- Ensure all authorized company vehicle drivers comply with this Program.

#### **Drivers:**

- Comply with the provisions in the Company Vehicle Assignment Agreement.
- Comply with the Company Driver Safety Program
- Properly report all accidents involving company vehicles in a timely manner.
- Follow the Company Vehicle Accident Reporting Procedure.
- Complete the Company Vehicle Driver Accident Report and submit to your supervisor and/or manager.

# ABM Technical Addendum

## Driver Safety Program



- Attend Driver Safety Courses as required by the Company. If attendance is required as a result of a traffic violation or a program violation, the employee will attend the course at their own time and expense.
- Maintain a valid state driver's license. Notify management immediately if your license has been suspended or revoked.

#### 4. General Requirements

All drivers will adhere to the Company Driver Safety Rules.

##### 4.1 Company Driver Safety Rules

- Maintain a valid driver's license. Notify management immediately if your license has been suspended or revoked.
- Drivers and passengers will wear seat belts while vehicle is in operation.
- Obey all traffic regulations, including applicable speed limits.
- Maintain safe distances between your vehicle and other vehicles.
- Drive defensively and in accordance with weather, highway and traffic conditions.
- Use of cell phones while operating vehicle is **Prohibited**.
- Do not respond to pagers while the vehicle is in motion.
- Texting is strictly **Prohibited**.
- Inspect the vehicle monthly and in accordance with this Program.
- Immediately notify management of any vehicle condition requiring repair or maintenance.
- Report all accidents promptly to your supervisor and/or management.
- Do not operate a vehicle at any time when ability to do so is impaired, affected, influenced by alcohol, illegal drugs, prescribed or over-the-counter medication, illness, fatigue or injury.
- Never pick up hitchhikers. Only authorized passengers are allowed, unauthorized passengers would include family members, friends and or any unauthorized co-workers.
- Never allow any unauthorized person to operate the Company vehicle. Unauthorized drivers would include family members, friends and or any unauthorized co-workers.
- Do not use a radar detector, laser detector or similar device to avoid the enforcement of speed limits by the police.
- Company vehicles should never exceed 80 MPH at any time.
- Do not use headphones, a Walkman or any device that will impair your ability to hear while driving.
- Comply with all applicable transportation regulations while transporting authorized materials, flammable liquids or gasses.
- Do not use the Company vehicle for the unauthorized transportation of goods, materials, equipment or passengers.
- Do not use the Company vehicle for any unauthorized or personal activity.
- Employees shall not modify company vehicles in any manner without written permission from Management.
- Employees shall never tamper with vehicle installed GPS tracking systems.
- Smoking and Vaping is **Prohibited** within company owned vehicles.

##### 4.2 Company Vehicle Driver Authorization

All employees using company vehicles will be authorized to drive a company vehicle once they meet or exceed the requirements of the ABM BES Underwriting Driving Criteria.

# ABM Technical Addendum

## Driver Safety Program



- Authorized drivers will complete and comply with the Company Vehicle Assignment Agreement.
- Authorized drivers will comply with the Company Driver Safety Program.
- Authorized drivers will comply with the Company Driver Safety Rules.
- Authorized driver will keep a company issued insurance card and current registration documentation in their company vehicle at all times.

### 4.3 Leased Vehicles Driver Authorization

Only eligible employees identified by management are authorized to lease vehicles for the purpose of conducting Company business.

- All requirements of this Program will apply while using a Company leased vehicle.
- Use of Company leased vehicle for personal use is strictly prohibited.
- Company leased vehicles will be secured from the Company's designated provider, when possible.
- Decline the additional insurance coverage offered by the vehicle lease company. Authorized employees are fully insured through the Company's automobile insurance program.

### 4.4 Personal Vehicle Driver Authorization

Only eligible employees identified by management are authorized to drive their personal vehicles for the purpose of conducting Company business.

- Eligible drivers must maintain liability insurance on their vehicle at all times.
- Eligible drivers must maintain a valid state driver license. You must notify management immediately if your license has been suspended or revoked.
- Eligible Drivers must comply with the Company Driver Safety Rules when operating their personal vehicle on company business.

### Use of Vehicles by Unauthorized Persons

Ineligible or unauthorized persons are not permitted to operate any company vehicle at any time.

#### No Exceptions!

- Employees failing to comply with this provision will be subject to disciplinary action up to and including termination.

### 4.5 Company Vehicle Driver Orientation and Training

- All employees who operate company vehicles will have the required identification, qualifications and training if applicable as confirmed through the driver eligibility process.
- Company vehicle driver orientation will include:
  - Eligible driver will review the Company Driver Safety Program with management. A copy will be kept in the vehicle at all times.
  - Eligible driver will review and sign the Company Vehicle Assignment Agreement. The original shall be kept in the employee's personnel file.
  - Eligible driver will review all vehicle inspection requirements.
  - Eligible driver will review all accident investigation and reporting procedures.
  - Eligible driver will review and sign the Company Driver Safety Rules. The original shall be kept in the employee's personnel file. A copy will be kept in the vehicle at all times.

### 4.6 Driver Safety Regulations

- Drivers and all occupants are required to wear safety belts when the vehicle is in operation. The driver is responsible for ensuring that passengers wear their safety belts.
- Drivers will not operate a vehicle at any time when his/her ability to do so is impaired, affected, influenced by alcohol, illegal drugs, prescribed or over-the-counter medication, illness, fatigue or injury.
- Drivers will abide by all federal, state and local motor vehicle regulations, laws and ordinances.
- Drivers are responsible for ensuring their vehicle is maintained in safe driving condition. Drivers will inspect their assigned vehicle monthly at a minimum and report to management.
- Drivers will follow the Company Driver Safety Rules.
- Drivers will follow proper load securing procedures at all times and assure that loads are secured within manufactures legal limits, federal, state and local regulations. The use of Bungie cords on the outside of the vehicle is prohibited, tie down straps should be used.
- Drivers will not store tools and equipment in the cab/passenger area of the vehicle.
- Drivers will keep storage areas organized in a manner that tools and equipment do not provide a hazard.

### 4.7 Vehicle Inspection and Maintenance

Proper inspection and maintenance of Company vehicles is an important component of this Program. Authorized drivers will inspect their vehicle in accordance with inspection and maintenance instructions within the Owner's Manual and as required by state law. Authorized drivers will complete the Company Vehicle Inspection Report (Attachment 1) on a quarterly basis. Dependent on vehicle use, more frequent inspections and reports may be required.

- Preventive maintenance (PM) is performed on a mileage or schedule basis. PM includes oil/filter changes, lubrication, tightening belts and components, engine tune-ups, brake work, tire rotation, hose inspection/replacement and radiator maintenance.
- Demand maintenance is performed as needed. These include light bulbs, window glass, gauges, wiring, airlines, etc. Other items may include worn vehicle components as detected from the vehicle condition report. Also included are tires, engines, transmissions, universal joints, bushings, batteries, etc. Since these conditions are detected through vehicle inspection, they can be listed in the PM program.
- Crisis maintenance occurs when the vehicle breaks down while on the road. This may be an expensive result of not having a quality PM program. Crisis maintenance situations should be minimized through effective PM programs.
- Authorized drivers will retain all Company vehicle maintenance and repair records in the vehicle. Copies of these records will be kept at the respective business unit.
- Improper maintenance may result in disciplinary action up to and including termination.
- Employees are required to keep their assigned vehicles in clean and presentable condition.

### 4.8 Company Vehicle Accident Reporting Procedure

Drivers will take the following actions when they are involved in any accident that occurs while operating any authorized vehicle for business purposes:

- If possible and permitted under state law, move the vehicle to a safe location out of the way of traffic. Call for medical attention if anyone is hurt.
- If other parties are involved, obtain names and addresses of drivers and occupants of involved vehicles; secure operator's license numbers, insurance company names and policy numbers, as well as the names and addresses of injured persons and witnesses. Record this information on the Company Vehicle Driver Accident Report form.

# ABM Technical Addendum

## Driver Safety Program



Do not discuss the details of the accident with anyone except an authorized Company representative and/or local law enforcement officer.

- Immediately notify management.

Vehicle thefts which involve loss of Company property:

- Immediately notify management.
- Make a police report listing all stolen items.
- Send a copy of the police report along with any additional information to Management.

#### 4.9 Accident Investigation and Analysis

Motor vehicle accidents are a serious concern to the Company. All company vehicle accidents must be investigated and reported. Accident report analyses may determine a need for:

- Intensive driver training and/or remedial training.
- Modified driver eligibility procedures.
- Modified vehicle inspection and/or maintenance activities.
- Changes in traffic routes.

Accident investigation procedures consist of:

- Determination and documentation of possible causes.
- Management review and support to expedite corrective action.
- Trend analysis to identify recurring events and establishment of control measures.

#### 4.10 Accident Reporting & Recordkeeping

Accident reports will be completed by all drivers and forwarded to their manager for review.

- Drivers are responsible for initiating the accident investigation as quickly as possible. The investigation should be thorough; utilizing the Company Vehicle Driver Accident Report form (Attachment 2). These blank forms are to be kept in the glove box of Company vehicles at all times.
- Drivers must contact their Supervisor immediately after any accident.
- Completed forms are to be submitted to management and safety with in no more than 24 hours of the incident.
- Management and Safety will review the accident investigation report and determine necessary corrective action to help prevent reoccurrence.

#### 4.11 Accident and Traffic Violation Review

Management will review the circumstances of all vehicle accidents and traffic violations. Management will take appropriate disciplinary action including, but not limited to:

- Requiring the driver to attend drivers' safety course at their own time and expense.
- Revocation of the eligibility to operate a leased or personal vehicle for business purposes.
- Suspension or termination of employment. (If driving is essential to performance of an employee's job duties, a suspension or revocation of the employee's driver's privileges may be cause for suspension or termination of employment.)

### 5. Rear-Ending & Backing Accidents

In the event of any vehicle accident that includes either of the following:

- Our driver rear-ending another vehicle



# ABM Technical Addendum

## Driver Safety Program

- Our driver backing into another vehicle

As soon as the Supervisor is notified of an event covered in this section, they must contact the branch General Manager, Safety and Human resources to determine if suspension is required.

The ABM driver will be required to follow all standard vehicle accident reporting procedures then when approved to leave the scene of the accident return immediately to their designated office (if the vehicle is drivable) and surrender the ABM vehicle to their supervisor. If the vehicle is not drivable, Supervision will be required to pick employee up at the scene.

For vehicle accident covered in this section and occurring within a 24-month period, drivers will be subject to the following disciplinary actions:

**1<sup>st</sup> offense:** Suspension of ABM driving privileges for 3 business days and the assignment of specialized driver training. (If driving is essential to performance of an employee's job duties, a suspension or revocation of the employee's driver's privileges could result in employee not working for the duration of the suspension.)

**2<sup>nd</sup> offense:** Suspension of ABM driving privileges for 7 business days and the assignment of specialized driver training. (If driving is essential to performance of an employee's job duties, a suspension or revocation of the employee's driver's privileges could result in employee not working for the duration of the suspension.)

**3<sup>rd</sup> offense:** Possible termination of employment, to be determined by ABM Management and Human Resources department.

### 6. Record Retention

Recommended maintenance and inspection records' retention is two (2) years. Accident investigation records are required to be retained for a minimum of five (5) years from the date of the accident or later dependent on any outstanding litigation.



# ABM Technical Addendum

## Powered Industrial Truck Program

### 1. OBJECTIVE

This policy specifies the procedure on operator selection, training and certification. Since more than eighty-five percent of all forklift accidents are caused by operator errors, training remains the most important aspect of the safe operation of industrial trucks.

### 2. CONTENTS

This policy consists of the following components:

- a) Policy Statement
- b) Responsibilities
- c) Initial Training and Certification of Industrial Truck Operator
- d) Annual Training Re-Certification of Industrial Truck Operator
- e) Disciplinary Action

### 3. APPENDIX (To be provided at the time of the training)

- a) Lift Truck Inspection Card
- b) Operator's Permit
- c) Driver Evaluation Form
- d) Acknowledgement Form

### 4. POLICY STATEMENT

It is the responsibility and goal of ABM to provide a safe and healthy workplace for all employees. It is the responsibility of the employees to follow established Company rules and procedures in conduction of business.

All employees who operate industrial lift trucks are required to be trained and certified prior to job assignment. ABM forklift and industrial truck training may only be provided by a qualified instructor. Only trained and certified operators are allowed to operate the equipment. All employees who operate industrial forklifts are required to have a valid driver's license and a "clear" MVR report (i.e. Be authorized by ABM Janitorial Services to operate a powered vehicle). Under no circumstance are any employees permitted to operate an industrial lift truck without completion of training and certification. It is the responsibility of the ABM supervisor to assure that this policy is implemented and followed at all times.

The three types of material handling equipment commonly used are forklifts, manual pallet jacks and electric pallet jacks. Therefore, training emphasis is placed on these three types of material handling equipment. Specific training is needed for any employees who will use any other types of material handling equipment in the course of their operation. This training program includes the formal instruction piece, practical training of the equipment itself and an operator's evaluation in the workplace.

### 5. RESPONSIBILITIES

#### 5.1. SAFETY MANAGER

Responsibilities include:

- Administer the Forklift Safety Operation Plan;
- Review and Update the Plan annually or as needed;
- Maintain and provide an annual training program for all employees;
- Maintain employee's training records.



# ABM Technical Addendum

## Powered Industrial Truck Program



### 5.2. SUPERVISORS

It is the supervisor's responsibility to assure that:

- All industrial truck operators are trained and certified;
- All operators understand the safe operation of an industrial truck;
- Assure that the industrial lift truck has been inspected before or during the shift for safe operation;
- Supervisors will conduct a random review of Inspection Cards to ascertain compliance;
- Lift Truck operators will follow and adhere to Company safety rules.

### 5.3. OPERATORS

It is the operator's responsibility to:

- Follow the Company rules when operating an industrial lift truck;
- Assure he/she has received proper training, understanding of the safe operation of an industrial lift truck and certification;
- All lift trucks are inspected at the beginning of each shift;
- Operate the industrial lift truck in a safe manner to prevent accidents from occurring;
- Verify that the forklift trailer chocks, supports and dock plates are properly secured prior to loading and unloading the forklift;
- Possess a valid driver's license.
- Insure that passengers are not allowed on or in vehicle unless it is equipped to accommodate.

If the operator is not sure that the forklift has been inspected, he/she is to check the Inspection Card (See Appendix I). If the Inspection Card is missing from the pouch, report to the supervisor immediately, get a new card, perform and document an inspection before operating the forklift.

## 6. INITIAL TRAINING AND CERTIFICATION

ABM's training includes formal instruction through the standard training program has been set up to assure that all forklift operators have a uniform understanding of safe and efficient forklift operations and safety rules.

The training course will consist of:

#### 1) Operating the equipment:

a. The lift truck and how it works including operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate; truck controls and instrumentation: where they are located, what they do, and how they work; engine or motor operation; steering and maneuvering; visibility (including restrictions due to loading); fork and attachment adaptation, operation, and use limitations; vehicle capacity; vehicle stability; any vehicle inspection and maintenance that the operator will be required to perform; refueling and/or charging and recharging of batteries; and operating limitations;

#### 2) Workplace-related topics:

- a. Surface conditions where the vehicle will be operated; composition of loads to be carried and load stability; load manipulation, stacking, and unstacking; pedestrian traffic in areas where the vehicle will be operated; narrow aisles and other restricted places where the vehicle will be operated; hazardous (classified) locations where the vehicle will be operated; ramps and other sloped surfaces that could affect the vehicle's stability; closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a build-up of carbon monoxide or diesel exhaust;
- b. Eye protection will be worn at all times while operating any piece of equipment unless the equipment is designed with an enclosed cab.

# ABM Technical Addendum

## Powered Industrial Truck Program



- 3) Other unique or potentially hazardous conditions in the workplace that could affect safe operation.
- 4) Written test; and
- 5) Operator's Evaluation Skill Test

An ABM Operator's Permit will be issued and it must be kept in the operator's possession at all times when operating an industrial truck.

Only operators successfully completing the lift truck training course and certified will be permitted to operate any industrial truck, including pallet jacks.

### **7. RE-TRAINING**

Refresher training, either complete training or specific areas, is required when:

- The operator has been observed to operate the industrial lift truck in an unsafe manner;
- The operator has been involved in a preventable accident or a near miss;
- The operator has received an evaluation that reveals that the operator is not operating the industrial lift truck safely or;
- There are changes in the working conditions or work environment that effects the use of the forklift;
- The operator is assigned to operate a different type of industrial lift truck.

This training must be documented.

### **8. THREE YEAR EVALUATION**

Each operator must receive an evaluation of their performance every three years. The Driver Evaluation Form (Appendix III) should be used.

### **9. DISCIPLINARY ACTION**

Violation of any part of this policy will result in disciplinary action according to Company policy.

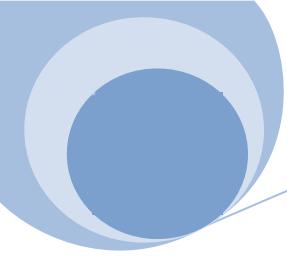
### **10. Equipment**

All mobile equipment shall be equipped with a working back up alarm. If equipment is rented/hired and is not equipped with a backup alarm, a spotter will be used at all times when backing up.

Seat belts will be worn at all times while operating mobile equipment if so equipped.

All operators have the responsibility of knowing the load limits of any equipment that they may operate. Load limits will never be exceeded by an operator. If loads to be moved exceed operational limits of equipment, operator with stop work immediately and contact supervisor. Loads must be secured for safe transport before any movement of the vehicle may happen.

Operators will never alter/modify equipment in any way to a state other than equipment was designed. Any abuse of this regulation will be cause for disciplinary action.



# ABM Technical Addendum

## Powered Industrial Truck Program



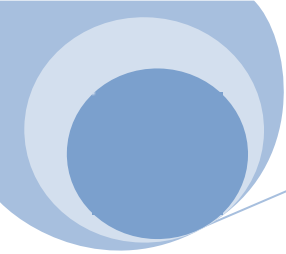
Operator will only utilize equipment in the manner for which it was designed. Any abuse of this regulation will be cause for disciplinary action.

### **11. Fueling**

Gasoline engine style vehicles will only be fueled in a well ventilated space, away from any combustibles with the equipment engine turned off and the key removed. Fueling will not be completed on any vehicle that has not had time to “cool” down before fueling.

Propane engine style vehicles will only have the propane tank changed in a well ventilated space, away from any combustibles with the equipment turned off and the key removed. Propane tanks shall not be stored in any occupied space but shall be properly stored as per site policies.

Electric powered vehicles shall be charged in a well ventilated area, away from any combustibles with the key removed and wheels chocked.



# ABM Technical Addendum

## Powered Industrial Truck Program



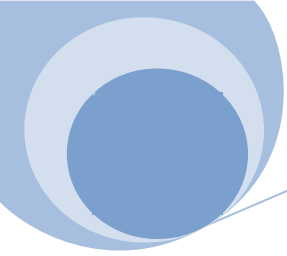
### ADDENDUM A

#### FORKLIFT OPERATOR EVALUATION

|                           |                         |
|---------------------------|-------------------------|
| OPERATOR'S NAME:          | DATE:                   |
| LOCATION:                 | PREVIOUS TRAINING DATE: |
| EVALUATOR/TRAINER'S NAME: |                         |

Check "S" if Satisfactory, "US" if Unsatisfactory

| INSPECTION ITEM                             | S | U | COMMENTS |
|---|---|---|----------|
| I PRE-OPERATIONAL INSPECTION                |   |   |          |
| . Forklift Checklist                        |   |   |          |
| Current forklift driver's certification     |   |   |          |
| I PICKING UP LOAD                           |   |   |          |
| I   |   |   |          |
| . Load distribution                         |   |   |          |
| Load stability                              |   |   |          |
| Tine positioning                            |   |   |          |
| Penetration into pallet                     |   |   |          |
| Tilt/lift                                   |   |   |          |
| Stopped forklift before load raised/lowered |   |   |          |
| Lowered to safe travel height before moving |   |   |          |
| Overhead obstruction check                  |   |   |          |
| Back out slowly/look behind                 |   |   |          |
| I TRAVELING WITH LOAD                       |   |   |          |
| I   |   |   |          |
| I   |   |   |          |
| .   |   |   |          |

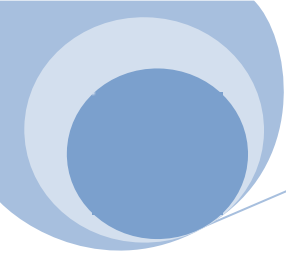


# ABM Technical Addendum

## Powered Industrial Truck Program



|             |  |  |  |
|-------------|--|--|--|
|             | Look in direction of travel                |  |  |
|             | Legs/arms inside running lines             |  |  |
|             | Sound horn at intersections/pedestrians    |  |  |
|             | Reasonable speed                           |  |  |
|             | Changing directions-stop                   |  |  |
|             | Look before backing                        |  |  |
|             | Riders                                     |  |  |
|             | Ramps and incline driving/seatbelts        |  |  |
|             | Braking                                    |  |  |
|             | Lift and lower load when traveling         |  |  |
|             | Distance between forklift vehicles         |  |  |
|             | Distance of tines from floor               |  |  |
|             | Mount/dismount                             |  |  |
|             | Double loads/awkward loads                 |  |  |
| I<br>√<br>. | LOAD MANIPULATION, STACKING,<br>UNSTACKING |  |  |
|             | Forklift centered                          |  |  |
|             | Speed of lift                              |  |  |
|             | Forward movement                           |  |  |
|             | Positioning load on rack                   |  |  |
|             | Back off slow/check for pedestrians        |  |  |
|             | Fork clear pallet before up/down           |  |  |
| √<br>.      | TRUCK LOADING/UNLOADING                    |  |  |



# ABM Technical Addendum

## Powered Industrial Truck Program



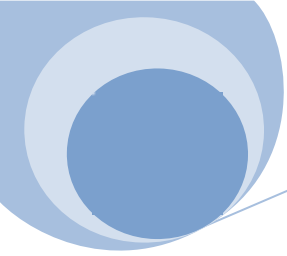
|                                   |  |  |  |
|-----------------------------------|--|--|--|
| Chocked/Jack stand                |  |  |  |
| Brakes set                        |  |  |  |
| Dockboard/bridgeplates            |  |  |  |
| Horn sounded                      |  |  |  |
| \ SAFETY PLATFORM USE<br> <br>.   |  |  |  |
| Secured                           |  |  |  |
| Horizontal travel                 |  |  |  |
| Passenger control                 |  |  |  |
| Pedestrian travel                 |  |  |  |
| \ BATTERY CHARGING<br> <br> <br>. |  |  |  |
| PPE (Safety Glasses, Gloves)      |  |  |  |
| Charger hook-up                   |  |  |  |

I certify that the above information is correct and accurate.

EVALUATOR/TRAINER'S NAME: \_\_\_\_\_

EVALUATOR/TRAINER'S SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_



# ABM Technical Addendum

## Powered Industrial Truck Program



### ADDENDUM B

#### **Forklift Daily Safety Checklist:**

##### **Inspect forklift daily before use and report problems with:**

- Brakes
- Warning systems
- Gauges
- Tires
- Forks
- Fuel systems
- Fluids
- Battery

##### **Before Starting the Forklift:**

- Check for leaks.
- Check that forks aren't bent, damaged, or cracked.
- Report any problems so they can be handled by trained authorized mechanics.
- Check load capacity--and stay within it (found on label or nameplate).
- Load is stable and can be centered; stack or tie if loose or uneven.
- Be sure that truck is rated for planned use and area.
- Check planned route for adequate lighting and headroom.
- Route is free of obstructions.

**Note:** any floor-surface problems or possible obstructions in planned route. Remove if possible; otherwise proceed with extra caution.

##### **Start Forklift and check:**

- All gages work properly
- All indicator work properly
- Moving parts work smoothly and properly
- Horn works properly

##### **Forklift is Safe to Operate**

---

Signature

# ABM Technical Addendum

## MEWP / Aerial Lift Program



### 1. POLICY

Powered platforms shall be used where conventional means of access (ladder, scaffold) for employees are considered unsafe.

### 2. RESPONSIBILITIES

Management shall ensure that powered platforms are properly used and maintained, and shall be responsible for ensuring that employees working on powered platforms have been properly trained.

Employees working on powered platforms are responsible for ensuring they are using the equipment safely, and inspecting the equipment prior to each use. Any employee assigned to work on an elevated platform must be trained in its operation prior to using the equipment.

### 3. INTRODUCTION

Powered platforms provide access at height to the interior and exterior of a building for maintenance. Platforms can be either suspended from roof or ceiling anchors, or vehicle-mounted lifts. Suspended power-operated working platforms consist of a roof car, or other suspension means, and the requisite operating and control devices. Vehicle-mounted platforms include elevating and work rotating platforms and manlifts (scissor lifts, man lifts, boom lifts, and aerial lifts) which are designed to lift employees to work at elevation. ABM operations that use powered elevated work platforms include window cleaning, lighting/sign maintenance, engineering, and other specialized janitorial tasks.

### 4. INSPECTION AND MAINTENANCE

Employees shall inspect the powered platform before every use. Operating and emergency controls, safety devices (such as anchors, outriggers, stabilizers, and guardrails), personal fall protection, and wheels and tires shall be in good working condition. Employees shall inspect for possible leaks (air, hydraulic fluid, and fuel-system) and loose or missing parts. Powered platforms in need of repair must not be used, and shall be marked, locked out, tagged out, and sent for repair. In addition to pre-use inspections, annual inspections and maintenance shall be performed on the equipment by an outside company specializing in this type of equipment.

Employees shall not modify this type equipment in any way without written approval from the equipment manufacturer.

### 5. SAFE WORK PRACTICES AND INCIDENT PREVENTION

Misuse or malfunction of powered platforms can result in serious injury to employees using the equipment, or to others in the vicinity. Documented procedures shall be in place to ensure the safety of those working on the platform and others. Platform equipment shall be operated in accordance with accepted safe work practices which include:

- A. All equipment controls will be inspected and tested before every use.
- B. Placing powered platform equipment on even, level, and non-slippery surfaces,
- C. Using outriggers and brakes properly.
- D. Closing lift platform chains or doors,
- E. If equipment is not equipped with a back-up alarm, a spotter will be used at all times.
- F. Stand only on the floor of the bucket or lift platform,
- G. Never climbing on or leaning over guardrails, or riding on bumpers,
- H. Remaining within load-capacity limits,



# ABM Technical Addendum

## MEWP / Aerial Lift Program



- I. Never operating powered platforms in extreme weather conditions including high wind areas,
- J. Keeping the powered platform clear of and protected from heat, or hazardous substances,
- K. Never operate Aerial lifts within 10 feet of energized power lines.
- L. Never moving the powered platform while elevated,
- M. Keeping the operating manual with the powered platform,
- N. Barricading the area around the powered platform equipment,
- O. Wearing and using personal fall protection equipment attached within the basket of the equipment is required.

In the event of an incident that causes injury or damage, emergency response procedures shall be in place to provide immediate assistance to an injured employee, or isolate any hazard caused by the incident.

### 6. FALL PROTECTION

All employees working with powered platforms shall wear personal fall protection. For more information on Fall Protection and/or personal fall arrest systems, refer to [Appendix C of 29 CFR 1910.66 Federal Regulations on Personal Fall Arrest System](#).

### 7. EMPLOYEE TRAINING

Employees who operate a powered platform shall be trained by a Competent Person to recognize and prevent safety hazards (e.g. electrical, fall, falling objects), safely operate the powered platform, maintain the equipment and personal fall protection equipment, and understand the emergency response procedures. Only trained employees shall operate powered platforms.

Employees shall be provided written work procedures for the operation, safe use and inspection of powered platforms. Initial and regular refresher training shall be provided, and employees shall be tested to ensure their understanding and knowledge.

### 8. RECORDS

All training, inspection and maintenance records pertaining to powered platforms shall be kept at the Branch office.

### 9. REFERENCES

[29 CFR 1910. 66](#) Federal Regulations on Powered Platforms for Building Maintenance

[29 CFR 1910. 67](#) Federal Regulations on Vehicle-Mounted Elevated and Rotating Work Platforms

[29 CFR 1910. 68](#) Federal Regulations on Manlifts

[ANSI A92.2-2001](#) Standard on Vehicle Mounted Elevating and Rotating Work Platforms available for purchase from ANSI

# ABM Technical Addendum

## Confined Space Program

### 1. PURPOSE

This Procedure defines permit-required spaces using the hazards of atmospheric conditions, engulfment, and configuration. This procedure requires site employees to work with the customer to identify such spaces, and take the necessary steps to control the exposures present and conform to all applicable standards.

### AREAS INVOLVED

Where ABM is responsible for Operations, Maintenance, and Repair of utilities and entry into permit confined spaces.

### 2. DEFINITIONS

**"Acceptable entry conditions"** means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

**"Attendant"** means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

**"Authorized entrant"** means an employee who is authorized by the employer to enter a permit space.

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

**"Confined space"** means 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.

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

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

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

**"Entry"** means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred when any part of the entrant's body breaks the plane of an opening into the space.

"**Entry permit (permit)**" means the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in paragraph (f) of this section.

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

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

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

- 1) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
- 2) Airborne combustible dust at a concentration that meets or exceeds its LFL; **NOTE:** This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.
- 3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- 4) Any other atmospheric condition that is immediately dangerous to life or health.

"**Hot work permit**" means the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

"**Immediately dangerous to life or health (IDLH)**" means 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.

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

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

**NOTE:** This procedure produces an IDLH oxygen-deficient atmosphere.

"**Isolation**" means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tag-out of all sources of energy; or blocking or disconnecting all mechanical linkages.

# ABM Technical Addendum

## Confined Space Program



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

"**Non-permit confined space**" means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

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

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

**Permit Procedure:** The written or printed document that is provided by the employer to allow and control entry into a permit space. This Permit can be obtained from site specific storage, EHS technician, or EHS manager.

"**Permit-required confined space (permit space)**" means a confined space that has one or more of the following characteristics:

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

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

"**Permit system**" means the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

"**Prohibited condition**" means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

**Emergency Rescue Team (ERT)** means the personnel designated to rescue employees from permit spaces.

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

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

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

# ABM Technical Addendum

## Confined Space Program



### 3. GENERAL REQUIREMENTS:

To specify the safe practices and procedures required for entry into the confined spaces and to provide a guideline for all ABM personnel that will be entering a confined spaces, acting as attendants, or signing the CSE permits.

### 4. ROLES AND RESPONSIBILITIES:

A. **Safety Manager** is responsible for the following:

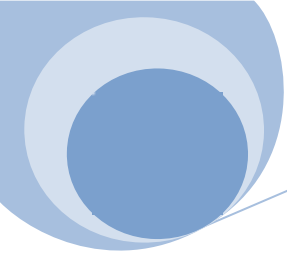
1. Provide guidance for the characterization of each confined space and the development of a space specific procedure.
2. Provide guidance for the proper selection and use of appropriate air monitoring equipment, respiratory protection and personal protective equipment to provide adequate protection to entrants.
3. Ensure the effective implementation of the program by serving as a technical resource to the site.

B. **Entry Supervisor** shall be responsible for the following:

1. Ensure the space is cleaned, ventilated and prepared prior to entry, if delegating to Attendant must ensure that responsibilities of supervisor are understood.
2. Prepare any equipment required by departmental procedures.
3. Call Rescue Team prior to entry.
4. Discuss the hazards of the space, hazards of activities to be performed and any special safety instructions with the trained attendant(s) and entrant(s).
5. Review the appropriate Confined Space database record with each entrant and attendant (if available at the site).
6. Verify that the permit is filled out completely.
7. Review and sign the permit.
8. Maintain equipment that is necessary to safely enter confined spaces.
9. Verify that ERT is available and that the means for summoning them are available.
10. Take the necessary measures to prevent entrance into prohibited permit spaces.
11. Sign permit when ownership of confined space is unclear.
12. Terminate entry and cancel the permit when (1) the entry operations covered by the permit have been completed, (2) a condition not allowed under the permit arises in or near the space, or (3) anytime there is an alarm that requires ERT response.
13. Inspect the space after the work is complete.
14. File and maintain the completed permit for 1 year.

C. **Authorized Entrants** shall be responsible for the following:

1. Know the hazards that may be faced during an entry, including information regarding the behavioral effects that may occur as a result from exposure to a hazard, include hazards that could be created by the work activity.
2. Review the appropriate Confined Space database record prior to entry (if available for the site).
3. Complete and sign the permit, take permit and database record to job.
4. (If available) Ensure that the Confined Space Database records are verified for accuracy prior to use during confined space entry operations. Redline change on the database record and give to the Database Editor.



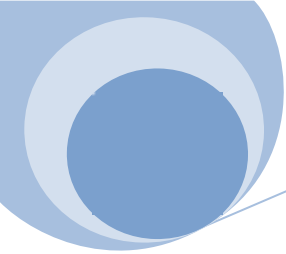
# ABM Technical Addendum

## Confined Space Program

5. Continuously monitor the space at the working height for oxygen; lower explosive limit (LEL) and toxic substances.
6. Know how to use the following:
  - a. Testing and monitoring equipment.
  - b. Communication equipment.
  - c. Barriers, signs or caution tape at the entrance of the confined space.
  - d. Personal protective equipment.
  - e. Proper lighting requirements.
  - f. Air movers and other ventilating equipment.
7. Communicating with the attendant so that the attendant may monitor entrant status.
8. Alerting the attendant whenever the entrant recognizes any signs of exposure or danger.
9. Exiting the space as quickly as possible when ordered to do so by the attendant or entry supervisor.
10. Inspect the space when the work is completed.
11. Store, clean, maintains and guard against damage, equipment used for confined space entry.
12. Report any deficiencies or malfunction of equipment to a supervisor.
13. Must wear a personal monitor at all times while in space.
14. Understand emergency procedures in case of an accident in the space.
15. Under no circumstance enter a confined to rescue a fellow employee.

**D. Attendant** shall be responsible for the following:

1. Know the hazards that may be faced during entry, including the signs or the symptoms and the consequences of exposure.
2. Review the appropriate Confined Space Database record prior to entry (if applicable to site)
3. Continuously maintain an accurate list of entrants on the permit.
4. Verify that the means for summoning rescue services are operable (i.e. phone, radio)
5. Review and sign the permit.
6. Continuously monitor the space at the working height for Oxygen; lower explosive limit (LEL) and toxic substances. Record readings on the permit at the working height, top and bottom of the space every three hours or more frequently as specified by the Entry Supervisor.
7. Remain outside the space during the entry until relieved by another attendant. If the Help or Fire Alarm is sounded the attendant must notify the entrants to evacuate the confined space. The attendant must remain at the entrance until all occupants have exited the confined space.
8. Communicate with the entrants to monitor entrant status.
9. May assist with handling of tools or equipment needed by the entrant(s) inside the confined space, provided that such assistance does not require the attendant to enter or leave the space or interfere with the primary duty to monitor the authorized entrant(s).
10. Monitor activities inside and outside the space to ensure it is safe for the entrants to remain in the space. Order entrants to evacuate if:
  - a. Behavioral effects of exposure are detected.
  - b. A prohibited condition occurs.
  - c. A situation inside or outside of the space exists that could endanger entrants.
  - d. The attendant cannot effectively perform all the permit requirements.
11. Prevent fouling of airlines, extension cords and/or lifelines.



# ABM Technical Addendum

## Confined Space Program



12. Warn and advise unauthorized persons to stay away from or exit immediately the confined space. Also, the attendant must inform the entry supervisor and authorized entrants if unauthorized persons enter the space.
13. Summon emergency personnel when necessary and provide any information useful in coordinating a rescue.
14. The attendant must be equipped with a two-way radio.

### G. Facility Manager - is responsible for the following:

1. Makes sure the confined space is clean, drained and ventilated (prepared for entry).
2. Make sure the appropriate Confined Space records are up to date (if available at the site).
3. Ensure that the Confined Space records are verified for accuracy prior to use during confined space entry operations.
4. Makes sure necessary safety equipment is available.
5. Makes sure people are trained in confined space entry.
6. Verifies each checklist item on permit.
7. Contacts the Safety Manager to reclassify a confined space.

### H. Emergency Response Team:

ABM may rely upon Customer Emergency Response Team for confined space rescues. If the customer does not have an ERT the site will have to contract with a company that provides this service.

### 5. PROCEDURAL DESCRIPTION:

The Facility has been evaluated to identify permit-required confined spaces using criteria published in 29 CFR 1910.146. Each Facility maintains a listing of confined spaces present in their respective areas. If a space is determined to be a permit-required confined space, then the requirements of this program shall be followed.

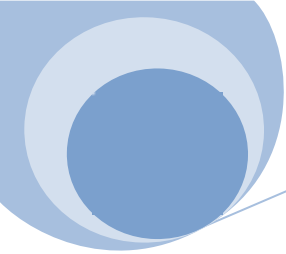
NOTE: Confined Space Criteria (Permit vs. Non-Permit Confined Spaces) For an enclosure to be considered a confined space it must meet the following three criteria:

- a. If must have limited means of entry and exit (this typically means anything other than a walk-through door).
- b. It is not intended for continuous human occupancy.
- c. It can be entered bodily to perform work.

#### A. Permit-Required Confined Spaces

1. A confined space becomes a Permit-Required Space when it:
  - a. Contains or has the potential to contain a hazardous atmosphere,
  - b. Contains a material that has the potential for engulfing an entrant,
  - c. 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
  - d. Contains any other recognized serious safety or health hazard.

#### B. Non Permit-Required Confined Spaces



# ABM Technical Addendum

## Confined Space Program



A Non Permit-Required space meets the criteria of a Confined Space, but does NOT present hazards that could cause death or serious physical harm.

### **C. Reclassification of a Permit Required to NON-Permit Required Confined Space**

The OSHA regulated process to reclassify a permit space is specific and detailed and is not completely explained here. Whenever there is an interest to reclassify a permit space, Facility Management will contact the Safety Manager for assistance to ensure that the reclassification process is understood and accurately followed.

### **D. Confined Space Entry Hazard Assessment and Control List**

All space hazards must be identified and assigned appropriate control measures for the permit space before entry. Minimum control measures must be documented as specified on the entry permit. The Confined Space Hazard Assessment can be used as a tool in characterizing the fixed area hazards associated with the confined space. It is ABM Site Management responsibility to ensure that the information on the Hazard Assessment is accurate. Each canceled entry permit shall be retained for at least 1 year to facilitate the review of the permit-required confined space program. Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.

### **E. Identifying Permit Confined Spaces (Signage)**

Standard signage will be posted to specifically identify each permit required confined space. Each Facility will be responsible for affixing the signage. Signage shall be attached to or not more than 1 foot away from the entry to the space. Each Facility that has newly installed or modified confined spaces should communicate these spaces to the Safety Manager

### **F Space Specific Hazard Characterization**

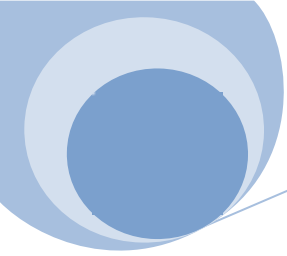
1. A hazard assessment should be conducted prior to entering any confined space. The following hazards shall be identified prior to entry: (for example)

- Atmospheric hazards
- Asphyxiating atmospheres
- Flammable atmospheres
- Toxic atmospheres
- Burn hazards
- Heat stress hazards
- Mechanical hazards
- Engulfment hazards
- Physical hazards (falls, debris, slipping hazards)
- Electrocution
- Danger of unexpected movement of machinery
- Noise hazards

### **G. Confined Space Entry Permits**

1. Personnel shall not enter a permit-required confined space without a permit and a copy of the Hazard Assessment.





# ABM Technical Addendum

## Confined Space Program



2. Approval for confined space entry will only be given after the Entry Supervisor has verified that all tests and safety precautions have been implemented and have reviewed the Hazard Assessment
3. The following signatures are required on Confined Space Entry Permit:
  - a. Entry/Shop Supervisor
  - b. Attendant(s)
  - c. Entrant(s)
4. Confined space entry permits will be valid for one work shift.
5. If the ERT informs the entry supervisor that they are unable to perform their duties, the permit is suspended and all activity in the permit confined space shall cease and all personnel will exit the permit confined space.
6. Any problems encountered during entry operations must be noted on the filed copy of the permit.
7. The completed confined space entry permit with the Hazard Assessment must be retained for a period of one year.

### H. Equipment Use and Maintenance

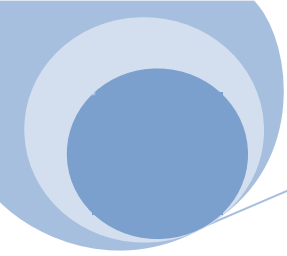
Equipment, including testing, ventilating, lighting, monitoring, communication and personal protective equipment, necessary for the safe entry into confined spaces shall be provided, maintained and properly used by each Facility. The equipment will be stored, inventoried and maintained by each Facility.

1. Equipment shall include, but not be limited to:

- Ventilation Equipment
- Air Monitoring Equipment
- Communication Devices
- Lighting
- GFI Extension Cord
- Fall Protection Devices, Safety Rope
- Safety Harness
- Safety Ladder
- Utility Ropes
- Safety Cones, Barricades, Signs, Safety Vests (as required for specific entries)
- Personal Protective Equipment (as required for entry/tasks)
- Any other equipment necessary for safe entry operations

### I. Welding/Cutting in Confined Spaces

1. Compressed gas cylinders, except those containing breathing air, shall not be allowed inside confined spaces.
2. All oxy-acetylene and inert gas hoses must be removed from the confined space, or must be disconnected at the regulator during breaks or other non-working periods.
3. Welding machines must be shut down if leads are to be left inside confined spaces during breaks or shift changes.
4. Confined space welding may require respiratory protection if ventilation does not adequately remove welding fumes. All welding/cutting involving stainless steel, galvanized metal, lead or nickel contaminated



# ABM Technical Addendum

## Confined Space Program

paint shall require appropriate respiratory protection, or an airflow adequate to remove the welding fumes from the confined space.

5. An approved dry chemical fire extinguisher shall be available near the entrance to a confined space while welding/cutting operations are in progress.

### J. Atmospheric Testing and Monitoring

Trained qualified personnel, prior to entry shall test all permit-confined spaces for atmospheric conditions. Appropriate atmospheric testing devices approved by the Safety manager shall test confined spaces. No instrument can detect all things; before using any atmospheric testing devices, know the hazards associated with the confined space. All entrant participants are encouraged to take part in testing.

#### 1. Purpose of Atmospheric Testing in Confined Spaces

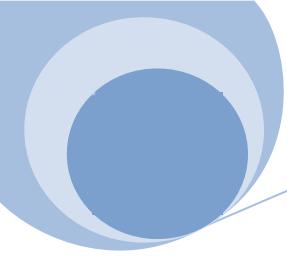
- a. Atmospheric testing is necessary for two purposes:
  - Evaluation of the hazards of the permit space
  - Verification of acceptable atmospheric conditions for entry

#### 2. Equipment Calibration

- a. It is recommended that all equipment be on a monthly P.M. schedule for calibration by an authorized individual.
- b. All equipment must be tested before each use and results documented.
- c. Fresh air testing is a testing method to make sure the equipment functions properly.
- d. Function testing is a testing method to make sure alarms and sensors respond properly.
- e. Equipment shall be tested to a specific standard gas that meets the manufacturer's guidelines for Function testing.
- f. The results of the function test must be documented on the Permit. Information needed:
- g. Device identification number
- h. Date test performed
- i. Signature of person performing test
- j. When atmospheric equipment is in use for a period of 24 hours or more, at least one function test must be completed during each 24-hour period.
- k. When test fails, calibration is required.

#### 3. Pre-Entry Testing

- a. All confined spaces must be prepared before testing. The space must be isolated, emptied, cleaned, and ventilated before atmospheric testing is completed.
- b. Obtain the permit for the specific confined space and the Hazard Assessment
- c. Verify that the atmospheric testing equipment being used has the capability to detect the hazards associated with the space.
- d. Turn off all ventilation equipment during the initial atmospheric testing.
- e. Start testing just outside of the confined space and gradually move the probe inward.
- f. Test at all levels in the space, top, middle, and bottom. Some gases or toxins are heavier or lighter than normal air.
- g. Allow time for instrument response. Oxygen concentration must be tested first, followed by LEL and toxicity, respectively.
- h. Oxygen allowable ranges are 19.5%-23.5%.



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## Confined Space Program

- i. Flammability allowable ranges are <10% of LEL.
- j. Toxicity - If there is a potential for a toxic atmosphere, a contaminant specific testing method must be used. **NOTE:** *Contact the Safety Manager for help with contaminant specific monitoring.*
- k. Both the attendant and entrant should verify that readings are taken and recorded accurately.

#### 4. Testing Stratified Atmospheres

When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress should be slowed to accommodate the sampling speed and detector response.

#### 5. Continuous Atmospheric Testing

- a. Atmospheric testing shall be conducted continuously while the entrant is in the space. Continuous testing will ensure that the entrant is notified if the atmosphere becomes hazardous.
- b. Continuous monitoring of the confined space requires that sensors to be placed in locations near the breathing zone of the entrant(s), using both remote and personal monitors.

### K. Providing Confined Space Attendants

- 1. Each Facility will provide at least one attendant outside a permit space to be entered for the duration of the entry operations.
- 2. Attendants shall monitor no more entry at a time.

### L. Ventilation of Confined Spaces

- 1. Adequate ventilation shall be provided for all work in confined spaces to assure that trapped vapors or fumes from work such as welding do not present a hazard to entrants.
- 2. Whenever possible, at least two openings, as remote from each other as practical, should be provided to facilitate "flow through" ventilation. Ventilation openings shall be chosen to minimize the possibility of drawing in air contaminated with vehicle exhaust, chemicals, vapor or dust.
- 3. Ventilation devices used in hazardous areas shall be equipped with a bonding wire and clamp. The bonding wire shall be clamped to the confined space at all times. If ventilation devices are needed to ventilate an excavation, the bonding wire shall be connected to a grounding rod located near the excavation.
- 4. If ventilation is to be accomplished using an electric blower system, the following guidelines must be followed: Ventilate the space for 15 minutes if its capacity is less than 6000 gallons. For spaces with capacity above 6000 gallons, consult the chart located on the blower housing for ventilation times.

It is important that everyone using ventilation complete the training and understand all the applications and limitations. Most importantly, ensure that the intake to the blower be in an area of clean air.

### M. Rescue and Emergency Procedure:

- 1. The Emergency Response Team (ERT) is designated as the Confined Space rescue team.
  - a. The ERT will be made aware of the hazards they may confront when called on to perform rescues.
  - b. The ERT should be notified of any; permit required confined spaces entry that is scheduled.

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## Confined Space Program

2. Rescue Stances Prior to any confined space entry, one of the two following rescue stances should be determined.

- a. Rescue Standby - This is the typical rescue stance that will be taken for most confined space entries. Response by ERT Confined Space Rescue team will be about 5 minutes. Upon arrival at the confined space, ERT Personnel will set up rescue equipment and then enter the space.
- b. Rescue Ready - This is a special rescue stance that is used in anticipation of a particularly dangerous entry or any IDLH verified entry. ERT rescue equipment is pre-rigged and on-site during the entire entry. ERT personnel should be notified Rescue Ready stance is required.

### **N. Retrieval systems:**

1. To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.

- a. Each authorized entrant shall use a full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, or above the entrant's head.
- b. The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.
- c. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet deep.

If an injured entrant is exposed to a chemical substance the Material Safety Data Sheet (MSDS) shall be made available to the medical facility treating the exposed entrant.

### **O. Preventing Unauthorized Entry**

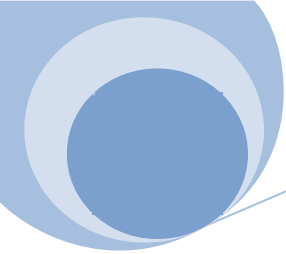
1. In order to prevent unauthorized entry into permit-required confined spaces, ABM Management will utilize the following mechanisms:

- a. Training all employees
- b. Posting warning signs
- c. Erecting barriers
- d. Installing locks or covers at entry points

### **P. Developing Safe Entry Practices**

1. Facilities will implement practices necessary for safe permit space entry operations. These include, but are not limited to:

- a. Specifying acceptable entry conditions (see Atmospheric Testing and Monitoring). Acceptable entry conditions will be maintained throughout the duration of an entry by means of atmospheric monitoring and inspection.
- b. Provide barriers as necessary to protect entrants from external hazards and to prevent unauthorized entry.
- c. Providing and reviewing record of the hazard assessment.



# ABM Technical Addendum

## Confined Space Program



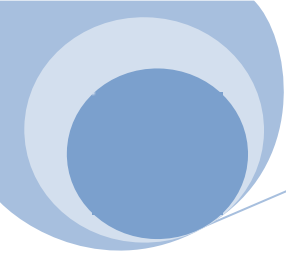
- d. Isolation of the permit space from electrical, mechanical, engulfment hazards, etc. Lockout of all energy sources.
- e. Additional hazard control such as cleaning and purging
- e. Ventilating, purging, inerting or flushing the permit space as necessary to eliminate or control atmospheric hazards.
- f. g. Pre-entry Briefing. The Entry Supervisor will conduct a meeting of all employees who will enter the confined space. Employees will be informed of the hazards and review safety conditions and emergency response procedures of the particular job.

### 2. Concluding Entry

- a. The Entry Supervisor will ensure that the space is ready to return to service and will terminate the permit. The permit will be filed for the purpose of review. The entry supervisor will also debrief the entrants and attendants concluding entry.

### Q. Contractor's Confined Space Entry Procedure

1. All outside contractors performing work in confined space entry permit area shall be informed of any fire, explosion, health or other safety hazards of that confined space. This information shall be based on current or past history of the confined space and the nature of the contractor's work procedure in making such disclosure.
2. Contractor will follow the Confined Space Permit given to them by ABM Coordinator. A Confined Space Permit shall be issued by an authorized ABM representative for contractors performing confined space work for ABM.
3. If new construction individual contractor confined Space entry Procedures may be substituted for ABM procedures.
4. Each Department shall inform contractors of ABM's and Customer safety rules and emergency plans, which may be applicable to the contractor's employees.
5. ABM personnel will review the Hazard Assessment with the contractor (if applicable).
6. Contractors and their employees must not be allowed to enter a confined space until the provisions of this procedure have been satisfied.
7. When both ABM and contractor personnel are working in or near permit spaces, their entry operations must be coordinated to avoid endangering any personnel.
8. At the conclusion of the entry operations, the contractor must be debriefed regarding the permit space procedure that was followed and concerning any hazards confronted or created in permit spaces during entry operations.
9. It is the responsibility of each contractor who is retained to perform permit space entry operations to obtain any available information regarding permit space hazards and entry operations from ABM management. ABM management must sign off on their permits.
10. ABM management must be informed of the permit space procedure that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operations.
11. The contractor shall provide written documentation of training before any person enters a confined space.
12. ABM personnel are required to perform initial monitoring prior to entry in addition to the initial monitoring performed by the contractor.



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## Confined Space Program



### R. ABM Employees Entering Confined Space

1. All ABM employees performing work in confined space entry permit areas shall be informed of any fire, explosion, health or other safety hazards of that confined space. This information shall be based on current or past history of the confined space and the nature of ABM work procedure in making such disclosure.
2. ABM employees will follow the Confined Space Permit.
3. ABM employees must not enter a confined space until the provisions of this procedure have been satisfied.
4. When both Customer or Contractor and ABM personnel are working in or near permit spaces, their entry operations must be coordinated to avoid endangering any personnel.
5. At the conclusion of the entry operations, ABM Facility Manager will be debriefed regarding the permit space procedure that was followed and concerning any hazards confronted or created in permit spaces during entry operations.
6. It is the responsibility of ABM employees to obtain any available information regarding permit space hazards and entry operations from the customer.

### S. Annual Review

1. All permits should be sent to the Facility Manager for annual review of their written permit space procedures and any cancelled permits. The review will be conducted in order to implement any continuous improvement revisions that become evident through the review process. If no permit entries have been performed, no review is required.
  - a. The following are examples of circumstances requiring the review of the permit-required confined space entry practices and program:
    - unauthorized entry into a permit space
    - the detection of permit space hazards not covered by the permit
    - the detection of a condition prohibited by the permit
    - the occurrence of an injury or near-miss during an entry
    - a change in the use or configuration of a permit space
    - employee complaints about the effectiveness of the program

### 6. Training

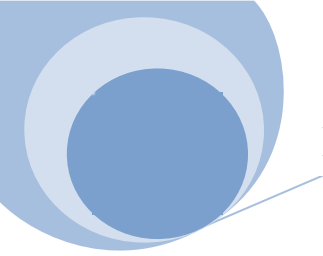
All ABM employees and contractors shall be trained in all applicable OSHA confined space entry standards before entering any confined space.

Training will occur prior to initial assignment, prior to change in duties, if any new hazard arises during entry process, and annual retraining of program requirements.

Written documentation of training must be retained for confined space entry training for the duration of ABM employee's service.

### 7. REFERENCES

29 FR 1910.146



# ABM Technical Addendum

## Electrical Safe Work Practices & NFPA 70E Program



### 1. POLICY

Only authorized and qualified electricians and engineers may service electrical systems. This program establishes minimum standards to prevent hazardous electrical exposures to authorized personnel and ensure compliance with regulatory requirements applicable to electrical systems. Working on equipment in a de-energized state is **required** unless de-energizing introduces an increased hazard or is infeasible. This written program has been established for **ABM** (hereafter referred to as “the Company”). State plan OSHA requirements may differ.

### 2. PURPOSE

The program is intended to protect ABM’s authorized and qualified workers against electrical shock, burns and other potential electrical safety hazards as well as comply with regulatory requirements. This program has been established in order to:

- Ensure the safety of employees who may work on or near electrical equipment.
- Ensure that employees understand and comply with safety standards related to electrical work.
- Ensure that employees follow uniform practices during the progress of electrical work.
- Comply with OSHA Standards according to the following key points:

1. Provide and demonstrate a safety program with defined responsibilities.
2. Provide personal protective equipment (PPE) for workers.
3. Provide documented training to workers.
4. Provide appropriate tools for safe work.

### 3. SCOPE

This program applies to ABM employees who are qualified electrical workers and engineers, and who have been trained and provided with the appropriate safe work procedures, protective equipment and other hazard controls. All company projects and facilities are included and must comply with this program. Copies of this written program, including a copy of the applicable OSHA Standards, are available for review by any employee.

Before any work is to commence or when unique hazards arise ABM will advise the host employer of:

- Any unique hazards presented by the work to be performed;
- Any unanticipated hazards found during the work that the host employer did not communicate;
- Measures taken to correct any hazards reported by the host employer to prevent such hazards from recurring in the future.

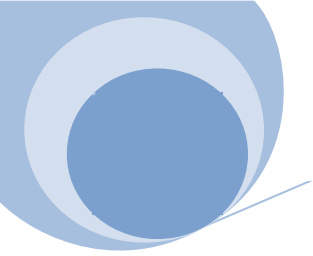
### 4. RESPONSIBILITIES

#### Branch Management:

- Evaluate work being performed and determine compliance with this program.
- Provide or assist in the task of specific training for electrical work qualifications.
- Maintain training recordkeeping.
- Periodically review and update this written program.
- Evaluate the overall effectiveness of the electrical safety program on a periodic basis.
- Ensure that all electrical and arc flash PPE is properly inspected and maintained.

#### Foremen/Supervisors

- Promote electrical safety awareness to all employees.



## Electrical Safe Work Practices & NFPA 70E Program

- Ensure employees comply with ALL provisions of the electrical safety program.
- Ensure employees receive training appropriate to their assigned electrical tasks and maintain documentation of such training.
- Develop and maintain a listing of all qualified employees under their supervision.
- Ensure employees are provided with and use appropriate protective equipment.
- Notify the Safety Manager of potential hazards requiring assessments, or improvements to the program.

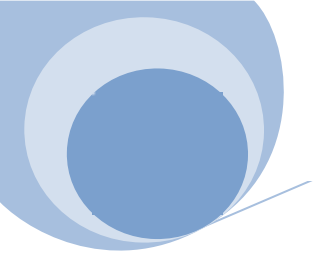
### Employees

- Follow the work practices described in this document, including the use of appropriate protective equipment and tools.
- Attend all training required relative to this program.
- Immediately report any concerns related to electrical safety to supervision.
- Properly maintain and inspect all personal protective equipment prior to each use.
- Properly maintain and inspect all electrical safety equipment (insulated hand tools, arc-rated faceshields, etc.).
- Wear all required personal protective equipment – there are no exceptions.
- Inspect the equipment in accordance with manufacturer’s guidelines and instructions.
- Report hazardous conditions or other health and safety concerns immediately to their supervisors/foremen/project managers.

### 5. DEFINITIONS

- **Authorized Lockout/Tagout Employee** - A person who has completed the required hazardous energy control training and is authorized to lockout or tagout a specific machine or equipment to perform service or maintenance. A person must be certified as an Authorized Lockout/Tagout Employee in order to apply a lock or tag to control hazardous energy. All Authorized Lockout/Tagout Employees must be trained in:
  1. ABM’s Energy Control Power Lockout/Tagout Training;
  2. Equipment specific procedures in their individual work units.
- **Balaclava** – a piece of protective apparel that is made of flame resistant fabric. It is worn over the head to protect the neck, face and head during an arc flash event. It is worn under the hardhat and faceshield.
- **Confined space** - An enclosed space which has limited egress and access, and has an atmospheric hazard (e.g., explosive atmosphere or asphyxiating hazard) and/or other serious safety hazards (e.g., electrical hazard).
- **Damp location** - Partially protected locations subject to moderate degrees of moisture, such as some basements.
- **De-energized electrical work** - Electrical work that is performed on equipment that has been previously energized and is now free from any electrical connection to a source of potential difference and from electrical charges.
- **Disconnecting (or Isolating) switch** - A device designed to close and/or open an electric circuit.
- **Dry location** - Locations not normally subject to dampness or wetness, as in the case of a building under construction.
- **Energized electrical work** - Repair, maintenance, troubleshooting, or testing on electrical circuits, components, or systems while energized (i.e., live). Only Qualified High Voltage Electrical Workers are permitted to work on energized circuitry of 50 volts/25 amps to ground or greater.
- **Energy source** - Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.





# ABM Technical Addendum

## Electrical Safe Work Practices & NFPA 70E Program

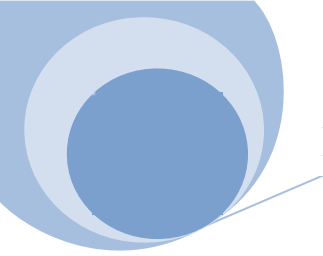


- **Exposed electrical parts** - Energized parts that can be inadvertently touched or approached nearer than a safe distance by a person. Parts not suitably guarded, isolated, or insulated. Examples include terminal contacts or lugs, and bare wiring.
- **Ground Fault Circuit Interrupt (GFCI)** - A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds a predetermined value that is less than that required to operate the over-current protective device of the supply circuit.
- **Ground** - A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth or to some conducting body that serves in place of the earth.
- **Hazardous Location** - An area in which an airborne flammable dust, vapor or gas may be present and would represent a hazard if a source of ignition were present (see National Fire Protection Association (NFPA) Class I & II and Division 1 & 2).
- **Interlock** - An electrical, mechanical, or key-locked device intended to prevent an undesired sequence of operations.
- **Isolating Switch** - A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and is intended to operate only after the circuit has been opened by some other means.
- **Life Safety Equipment** - Equipment that provides critical protection for safety in the event of an emergency or other serious hazard. Life safety equipment, which is electrically energized, should be worked on using Energized Electrical Equipment (EEW) procedures to ensure that the protection provided by the equipment is not lost (e.g., fire alarm and evacuation).
- **Lockout** - The placement of a lock on an energy-isolating device according to procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
- **Lockout / tagout** - A standard that covers the servicing and maintenance of machines and equipment in which the unexpected re-energization of the equipment or release of stored energy could cause injury to employees. It establishes performance requirements for the control of such hazardous energy.
- **Qualified Electrical Worker** – A qualified person trained and knowledgeable of construction and operation of equipment or a specific work method and is trained to recognize and avoid the electrical hazards that might be present with respect to that equipment or work method.

- 1 Qualified electrical workers must be familiar with the proper use of the special precautionary techniques, personal protective equipment (PPE), including arc-flash, insulating and shielding materials, and insulated tools and test equipment. A person can be considered qualified with respect to certain equipment and methods but is unqualified for others.
- 2 An employee who is undergoing on-the-job training and who, in the course of such training, has performed duties safely at his or her level of training and who is under the direct supervision of a qualified person must be considered to be qualified.
- 3 Only a Qualified Electrical Worker is allowed to work on energized circuits.

**Note One:** Whether a person is considered to be a “qualified” person will depend upon various circumstances in the workplace. It is possible and, in fact, likely for an individual to be considered “qualified” with regard to certain equipment in the workplace, but “unqualified” as to other equipment.

**Note Two:** An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person is considered to be a qualified person for the performance of those duties.



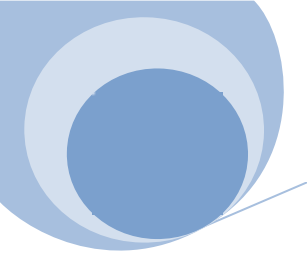
# ABM Technical Addendum

## Electrical Safe Work Practices & NFPA 70E Program

- **Remote-control Circuit** - Any electric circuit that controls any other circuit through a relay or an equivalent device.
- **Service** - The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.
- **Service Equipment** - The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the entrance of supply conductors to the building and intended to constitute the main control and means of cutoff of the supply.
- **Setting Up** - Any work performed to prepare a machine or equipment to perform its normal production operation.
- **Switching Devices** - Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cutouts, disconnecting (or isolating) switches, disconnecting means, interrupter switches, and oil (filled) cutouts.
- **Tagout** - The placement of a tagout device on an energy-isolating device according to procedure to indicate that the equipment may not be operated until the tagout device is removed.
- **Voltage (of a circuit)** - The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.
  
- **Voltage, high** - Voltage exceeding 600 Volts A.C. and D.C.
- **Voltage, low** - Voltage less than 600 Volts A.C. and D.C.
  
- **Voltage, nominal** - An approximate value assigned to a circuit or system for the purpose of conveniently designating its voltage class, e.g., 120/240, 480/277, and 600.
- **Wet location** - Installations subject to saturation with water or other liquids.

### 5.1 DEFINITIONS (for Arc Flash Safety)

- **Arc blast** - A pressure wave containing gaseous forms of metal created from an electrical current fault. The arc blast may be of sufficient intensity to knock a standing person down or off a ladder. The arc blast may also be of sufficient intensity to produce human injury.
- **Arc flash** - The arc flash may be composed of radiant and convective energy, arc blast vapors, molten metal droplets, sound pressure, shock waves, intense light, and projectiles.
- **ATPV** - Arc Thermal Performance Exposure Value. The minimum incident arc energy in calories per centimeter squared capable of causing the onset of a second-degree burn. ATPV is defined in American Society for Testing of Materials standard F1959/F 1959/M as a test method for flame retardant clothing.
- **Boundary, Flash Protection** - The linear distance in all directions from an exposed energized electrical component that is just far enough away from the source to prevent permanent injury from an arc flash due to a fault current.
- **Boundary, Limited Shock** - The linear distance in all directions from an exposed energized electrical part that defines the safe approach distance for unqualified persons.
- **Break-open threshold energy (EBT)** - Maximum incident energy values that do not cause Flame Resistant (FR) material to break-open, and do not cause second degree burns on skin covered by the FR material.
- **Current limiting devices** - Certain types of fuses or circuit breakers that, when interrupting current within its current-limiting range, will reduce the current in the faulted circuit to a substantially lower magnitude. Properly selected current limiting devices can limit the let-through energy to a level within the rating of downstream circuit components, even in the presence of high available system short-circuit current.

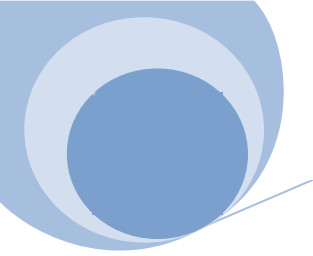


# ABM Technical Addendum

## Electrical Safe Work Practices & NFPA 70E Program

- **Electrically Safe Work Condition** - De-energizing and securing energy sources to ensure employee safety. An electrically safe work condition is established by:
  1. Identifying all sources of the electrical supply
  2. Opening the disconnecting device for each supply
  3. Visually inspecting where possible, the disconnecting device to ensure that the switch has opened
  4. Locking out all disconnecting devices to prevent unexpected re-energization
  5. Testing the circuit with an adequately rated test device (voltage tester or volt ohmmeter). The performance of the test instrument must be verified before and after each use
  6. Grounding the phase conductors or components if induced voltage or stored electrical energy is present.
- **Electrical Systems** - Systems and associated equipment, which provides for the generation, transmission, conversion, distribution and use of electrical power.
- **Fault current** - An electrical current that is following the path of least resistance, either from one phase to another, or to ground. This alternate path may be insufficient to contain the current, resulting in damage from extreme heat, fire, or flying components.
- **High Voltage** - Voltage exceeding 600 Volts A.C. and D.C.
- **Incident energy** - Energy from arc, both radiant and convective, that is actually received per unit area, in calories/cm<sup>2</sup>
- **Low Voltage** - Voltage less than 600 Volts A.C. and D.C.
- **Qualified Person** - A person with relevant education and experience to enable him or her to avoid dangers which electricity may create, and are authorized and competent to carry out specific work on the electrical distribution system.
- **Senior Qualified Person** - Appointed person who has direct management responsibility for the electrical power distribution system. Must be a Qualified Engineer.
- **Unqualified Person** - Person adequately trained to enable him/her to avoid dangers which electricity may create but are not authorized to work on electrical systems.
- **Voltage Tester** - A device capable of measuring the presence of voltage. These may be either solenoid operated or digital indicating. These units may also incorporate special features, such as the ability to indicate continuity. For the purposes of this procedure it does not include tick-tracers.
- **Volt-Ohm Meter (VOM)** - A metering device capable of measuring continuity, voltage, and current. These units may also incorporate other special features, such as the ability to indicate capacitance and true Root Mean Square (RMS). These devices are also called multimeters.

### 6. PROGRAM REQUIREMENTS – PROCEDURES & SAFE WORK PRACTICES



# ABM Technical Addendum

## Electrical Safe Work Practices & NFPA 70E Program



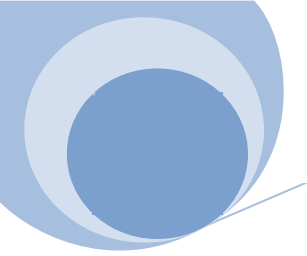
### 6.1 Portable Electrical Equipment and Extension Cords

All electrical testing instruments, equipment and their accessories must have the proper rating for the circuits and equipment to which they will be connected. These must meet ANSI standards for the rating and design requirement for voltage measurement and test instruments intended for use on electrical systems up to 1000 Volts.

When testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the testing instruments must be verified to be in proper working order before and after the test is performed.

The following requirements apply to the use of cord-and-plug-connected equipment and flexible cord sets (extension cords):

- Extension cords may only be used to provide temporary power.
- Portable cord-and-plug connected equipment and extension cords must be visually inspected before use on any shift for external defects such as loose parts, deformed and missing pins, or damage to outer jacket or insulation, and for possible internal damage such as pinched or crushed outer jacket. Any defective cord or cord-and-plug-connected equipment must be removed from service and no person may use it until it is repaired and tested to ensure it is safe for use.
- Extension cords must be of the three-wire type. Extension cords and flexible cords must be designed for hard or extra hard usage (for example, types S, ST, and SO). The rating or approval must be visible.
- Job-made extension cords are forbidden per the electrical code.
- Personnel performing work on renovation or construction sites using extension cords or where work is performed in damp or wet locations must be provided, and must use, a ground-fault circuit interrupter (GFCI).
- Portable equipment must be handled in a manner that will not cause damage. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment.
- Extension cords must be protected from damage. Sharp corners and projections must be avoided. Flexible cords may not be run through windows or doors unless protected from damage, and then only on a temporary basis. Flexible cords may not be run above ceilings or inside or through walls, ceilings or floors, and may not be fastened with staples or otherwise hung in such a fashion as to damage the outer jacket or insulation.
- Cords must be covered by a cord protector or tape when they extend into a walkway or other path of travel to avoid creating a trip hazard.
- Extension cords used with grounding-type equipment must contain an equipment-grounding conductor (i.e., the cord must accept a three-prong, or grounded, plug).
- Attachment plugs and receptacles may not be connected or altered in any way that would interrupt the continuity of the equipment grounding conductor. Additionally, these devices may not be altered to allow the grounding pole to be inserted into current connector slots. Clipping the grounding prong from an electrical plug is prohibited.



# ABM Technical Addendum

## Electrical Safe Work Practices & NFPA 70E Program

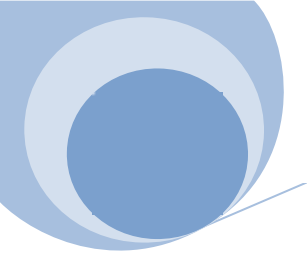


- Flexible cords may only be plugged into grounded receptacles. The continuity of the ground in a two-prong outlet must be verified before use. It is recommended that the receptacle be replaced with a three-prong outlet. Adapters that interrupt the continuity of the equipment grounding connection may not be used.
- All portable electric equipment and flexible cords used in highly conductive work locations, such as those with water or other conductive liquids, or in places where employees are likely to contact water or conductive liquids, must be approved for those locations.
- Employee's hands must be dry when plugging and unplugging flexible cords and cord-and-plug connected equipment if energized equipment is involved.
- If the connection could provide a conducting path to employees' hands (for example, if a cord connector is wet from being immersed in water), the energized plug and receptacle connections must be handled only with insulating protective equipment.
- Locking-type connectors must be properly locked into the connector.
- Lamps for general illumination must be protected from breakage, and metal shell sockets must be grounded.
- Temporary lights must not be suspended by their cords unless they have been designed for this purpose.
- Extension cords are considered to be temporary wiring, and must also comply with the section on "Requirements for Temporary Wiring" in this program.

### 6.2 Requirements for Temporary Wiring

Temporary electrical power and lighting installations 600 volts or less, including flexible cords, cables and extension cords, may only be used during and for renovation, maintenance, repair, or experimental work. The duration for temporary wiring used for decorative lighting for special events and similar purposes may not exceed 90 days. The following additional requirements apply:

- Ground-fault protection (e.g., ground-fault circuit interrupters, or GFCI) must be provided on all temporary-wiring circuits, including extension cords, used on construction sites.
- In general, all equipment and tools connected by cord and plug must be grounded. Listed or labeled double insulated tools and appliances need not be grounded.
- Feeders must originate in an approved distribution center, such as a panel board, that is rated for the voltages and currents the system is expected to carry.
- Branch circuits must originate in an approved power outlet or panel board.
- Neither bare conductors nor earth returns may be used for the wiring of any temporary circuit.



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- Receptacles must be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit must contain a separate equipment-grounding conductor, and all receptacles must be electrically connected to the grounding conductor.
- Flexible cords and cables must be of an approved type and suitable for the location and intended use. They may only be used for pendants, wiring of fixtures, connection of portable lamps or appliances, elevators, hoists, connection of stationary equipment where frequently interchanged, prevention of transmission of noise or vibration, data processing cables, or where needed to permit maintenance or repair. They may not be used as a substitute for the fixed wiring, where run through holes in walls, ceilings or floors, where run through doorways, windows or similar openings, where attached to building surfaces, or where concealed behind building walls, ceilings or floors.
- Suitable disconnecting switches or plug connects must be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.
- Lamps for general illumination must be protected from accidental contact or damage, either by elevating the fixture or by providing a suitable guard. Hand lamps supplied by flexible cord must be equipped with a handle of molded composition or other approved material and must be equipped with a substantial bulb guard.
- Flexible cords and cables must be protected from accidental damage. Sharp corners and projections are to be avoided. Flexible cords and cables must be protected from damage when they pass through doorways or other pinch points.

### 6.3 Wet or Damp Locations

Work in *wet or damp work locations* (i.e., areas surrounded or near water or other liquids) should not be performed unless it is absolutely critical. Electrical work should be postponed until the liquid can be cleaned up. The following special precautions must be incorporated while performing work in *damp locations*:

- Only use electrical cords that have Ground Fault Circuit Interrupters (GFCIs);
- Remove standing water before beginning work. Work is prohibited in areas where there is standing water;
- Do not use electrical extension cords in wet or damp locations.
- Keep electrical cords away from standing water.

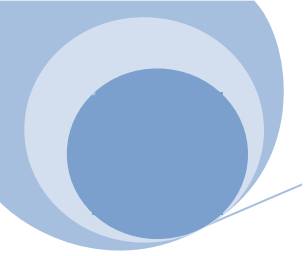
### 6.4 Working on De-Energized Equipment

#### Electrically Safe Condition

The most important principle of electrical safety is to **assume all electric circuits are energized unless each involved worker ensures they are not.** Every circuit and conductor must be tested every time work is done on them.

- Proper PPE must be worn until the equipment is proven to be de-energized.
- Voltage rated gloves and leather protectors must be worn.
- Safety glasses must be worn.
- **The required Arc Flash PPE must also be worn when verifying the de-energized state. All arc flash and electrical PPE can be removed once the enclosure has been verified as “dead.”**

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



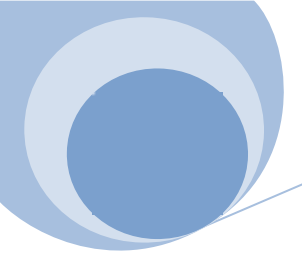
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1. Identify all sources of power to the equipment.
2. Remove the load current, and then open the disconnecting devices for each power source.
3. Where possible, visually verify that blades of disconnecting devices are fully open or that drawout-type circuit breakers are fully withdrawn.
4. Apply lockout/tagout devices in accordance with a formal, written policy.
5. Test each phase conductor or circuit part with an adequately rated voltage detector to verify that the equipment is de-energized. Test each phase conductor or circuit part both phase-to-phase and phase-to-ground. Check the voltage detector before and after each test to be sure it is working.
6. Properly ground all possible sources of induced voltage and stored electric energy (such as, capacitors) before touching. If conductors or circuit parts that are being de-energized could contact other exposed conductors or circuit parts, apply ground-connecting devices rated for the available fault current.

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

### 6.5 Lockout/Tagout Procedures

- Each employee must be trained in ABM's Energy Control Power Lockout/Tagout program and be familiar with the appropriate procedures.
- **Lockout/tagout application:** Each person who could be exposed to electric energy must be involved in the lockout/tagout process.
- Follow the posted lockout/tagout procedures: 1) Prepare & Notify 2) Shut-Down equipment 3) Isolate Hazardous Energy 4) Apply LOTO Devices 5) Control Stored Energy 6) Verify & Test 7) Begin LOTO work.
- A lock/lockout device with a tag that will be attached to a disconnecting device to prevent the re-energizing of the equipment being worked on without removal of the lock. The lockout device will have a "Danger Do Not Operate" tag with the employee name on the tag. That employee must be the only person who has the key for the lockout device they install, and that employee will be the only person to remove the lock after all work has been completed.
- A tagout device is a tag and a way to attach it that can withstand at least 50 pounds of force. Tagout devices should be used alone only when it is not possible to install a lockout device.
- The tag used in conjunction with a lockout or tagout device must have a label prohibiting unauthorized operation of the disconnecting means or unauthorized removal of the device. It will also be used as a means of identifying the lock holder.
- Electric lockout/tagout procedures should be posted at the machines location.
- **Individual qualified-employee control procedure:** For minor servicing, maintenance, inspection, and so on, on plug-connected equipment, work may be done without attaching lockout/tagout devices if the plug is next to where the employee is working, is always easy to see, and the equipment is never left alone while being serviced.
- **Return to service:** Once work is completed and lockout/tagout devices removed, tests and visual inspection must confirm that all tools, mechanical restraints, electric jumpers, shorts, and grounds have been removed. Only then is it safe to re-energize and return to service. Employees responsible for operating the equipment and needed to safely re-energize it should be out of the danger zone before equipment is re-energized.
- **Temporary release:** If the job requiring lockout/tagout is interrupted for testing or positioning equipment, follow the same steps as in return to service (above).



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### 6.6 Working On or Near Energized Equipment

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

- Taking voltage measurements;
- Opening and closing disconnects and breakers;
- Racking breakers on and off the bus;
- Removing panels and dead fronts;
- Opening electric equipment doors for inspection.

### Precautions

When working on de-energized parts, but while still inside the arc flash protection boundary for nearby live exposed parts:

- If the parts cannot be de-energized, barriers such as insulated blankets must be used to protect against accidental contact or PPE must be worn.
- Employees must not reach blindly into areas that might contain exposed live parts.
- Employees must not enter spaces containing live parts unless illumination is provided that allows the work to be performed safely.
- Conductive articles of jewelry and clothing (such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear, or metal frame glasses) must not be worn where they present an electrical contact hazard with exposed live parts.
- Conductive materials, tools, and equipment that are in contact with any part of an employee's body must be handled in a manner that prevents accidental contact with live parts. Such materials and equipment include, but are not limited to long conductive objects such as ducts, pipes, tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members, and chains.
- When an employee works in a confined space or enclosed spaces (such as a manhole or vault) that contains exposed live parts, the employee must use protective shields, barriers or insulating materials as necessary to avoid contact with these parts. Doors, hinged panels, and the like must be secured to prevent them from swinging into employees. Refer to the confined space entry program.

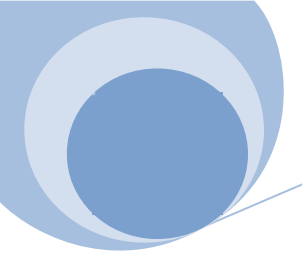
### Justification for Work

Live parts to which an employee might be exposed must be put into an electrically safe work condition before an employee works on or near them, unless the employer can demonstrate that de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Energized parts that operate at less than 50 volts to ground must not be required to be de-energized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

### 6.7 Energized Electrical Work Permit

- Where required:





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If live parts are not placed in an electrically safe work condition (for the reasons of increased or additional hazards or infeasibility) work to be performed must be considered energized work and must be performed by written permit only.

- **Elements of Work Permit:**

The energized electrical work permit must include, but not limited to, the following items:

1. A description of the circuit and equipment to be worked on and their location.
2. Justification for why the work must be performed in an energized condition.
3. A description of the safe work practices to be employed.
4. Results from the shock hazard analysis.
5. Determination of shock protection boundaries.
6. Results of the arc flash analysis.
7. The flash protection boundary
8. The necessary personal protective equipment to safely perform the assigned task.
9. Means employed to restrict the access of unqualified persons from the work area.
10. Evidence of completion of a job briefing, including a discussion of any job-specific hazards.
11. Energized work approval (authorizing or responsible management, safety officer, or owner, etc.) signature(s).

### **Elements of Work Permit**

Work performed on or near live parts by qualified persons related to tasks such as testing, troubleshooting, voltage measuring, etc., may be permitted to be performed without an energized electrical work permit, provided appropriate safe work practices and personal protective equipment are used. This may only be performed by qualified persons within the limited approach boundary.

### **6.8 Approach Boundaries to Live Parts**

#### **Shock Hazard Analysis**

A shock hazard analysis must determine the voltage to which personnel will be exposed, boundary requirements, and the personnel protective equipment necessary in order to minimize the possibility of electric shock to personnel.

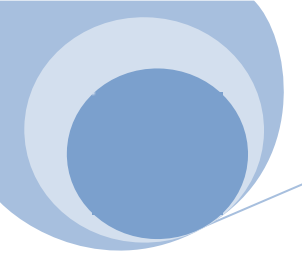
#### **Shock Protection Boundaries**

The shock protection boundaries identified as Limited, Restricted, and Prohibited Approach Boundaries are applicable to the situation in which approaching personnel are exposed to live parts. See NFPA Table 130.2(C) for the distances associated with various system voltages.

#### **Approach to Exposed Live Parts Operating at 50 Volts or More.**

No qualified person must approach or take any conductive object closer to exposed live parts operating at 50 volts or more than the Restricted Approach Boundary set forth in NFPA table 130.2(C), unless any of the following apply:

- The qualified person is insulated or guarded from the live parts operating at 50 volts or more (insulating gloves or insulating gloves and sleeves are considered insulation only with regard to the energized parts upon which work is being performed), and no uninsulated part of the qualified person's body crosses the Prohibited Approach Boundary set forth in Table 130.2(C);



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- The live part operating at 50 volts or more is insulated from the qualified person and from any other conductive object at a different potential;
- The qualified person is insulated from any other conductive object as during live-line bare-hand work.

### Approach by Unqualified Persons

Unqualified persons must not be permitted to enter spaces that are accessible to qualified employees only, unless the electric conductors and equipment involved are in an electrically safe work condition.

### Working at or Close to the Limited Approach Boundary

Where one or more unqualified persons are working at or close to the Limited Approach Boundary, the designated person in charge of the work space where the electrical hazard exists must cooperate with the designated person in charge of the unqualified person(s) to ensure that all work can be done safely. This must include advising and warning him or her to stay outside the Limited Approach Boundary.

### Entering the Limited Approach Boundary

Where there is a need for an unqualified person(s) to cross the Limited Approach Boundary, a qualified person must advise him or her of the possible hazards and continuously escort the unqualified person(s) while inside the Limited Approach Boundary. Under no circumstances must the escorted unqualified person(s) be permitted to cross the Restricted Approach Boundary.

### Flash Hazard Analysis

A flash hazard analysis must be done in order to protect personnel from the possibility of being injured by an arc flash. The analysis must be determine the Flash Protection Boundary and the personal protective equipment that people within the Flash Protection Boundary must use.

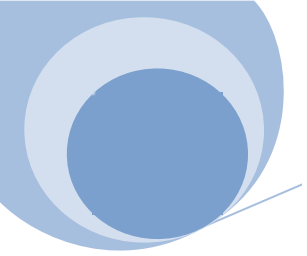
### Flash Protection Boundary

The arc flash boundary shall be the distance at which the incident energy equals 5 J/cm<sup>2</sup> (1.2 cal/cm<sup>2</sup>). (Informational Note: for information on estimating the arc flash boundary, see NFPA 70E (2015) Informative Annex D.) The arc flash boundary shall be determined by Table 130.7(C)(15)(A)(b) or Table 130.7(C)(15)(B), when the requirements of these tables apply.

## 6.9 Personal Protective Equipment

### General Requirements

- Employees working in areas where there are potential electrical hazards must be provided with and use personal protective equipment (PPE) that is appropriate for the specific work to be performed. The electrical tools and protective equipment must be specifically approved, rated, and tested for the levels of voltage of which an employee may be exposed.
- Employees must wear nonconductive head protection whenever there is a danger of head injury from electric shock or burns due to contact with live parts or from flying objects resulting from an electrical explosion.
- Employees must wear protective equipment for the eyes whenever there is a danger of injury from electric arcs, flashes, or from flying objects resulting from an electrical explosion.



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- Employees must wear rubber insulating gloves where there is a danger of hand or arm contact with live parts or possible exposure to arc flash burn. Leather ‘protector’ gloves must be worn over the rubber insulating gloves. Exposures to live conductors of 50 VAC or greater requires the use of rubber insulating gloves and leather protector gloves.
- Face shields without arc rating must not be used for electrical work. Safety glasses or goggles must always be worn underneath face shields.
- Additional illumination may be needed when using tinted face shields as protection during electrical work.
- Electrical Protective Equipment must be selected to meet the criteria established by the American Society of Testing and Materials (ASTM) and by the American National Standards Institute (ANSI).
- Insulating equipment made of materials other than rubber must provide electrical and mechanical protection at least equal to that of rubber equipment.
- PPE must be maintained in a safe, reliable condition and be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage.
- Employees must use insulated tools and handling equipment that are rated for the voltages to be encountered when working near exposed energized conductors or circuit. Tools and handling equipment should be replaced if the insulating capability is decreased due to damage. Protective gloves must be used when employees are working with exposed electrical parts above fifty (50) volts.
- Fuse handling equipment (insulated for circuit voltage) must be used to remove or install fuses when the fuse terminals are energized. Ropes and hand lines used near exposed energized parts must be non-conductive.
- Protective shields, barriers or insulating materials must be used to protect each employee from shock, burns, or other electrical injuries while that person is working near exposed energized parts that might be accidentally contacted or where dangerous electric heating or arcing might occur.

A. Each of our work locations, regardless of their size or function, must have an electrical arc flash risk assessment conducted by a qualified person. The arc flash risk assessment must be updated whenever significant changes are made to the processes or facility. The risk assessment will include proper identification and labeling of the PPE categories of all of our electrical enclosures.

- For those instances with typical work on 480 VAC circuits and lower, NFPA 70E (2015) provides for conditional relief from some of the PPE requirements via the implementation of a **Task-Based PPE Risk Assessment**. Based on the results of this assessment, as performed by a qualified person, it can result in the avoidance and or elimination of various elements of the PPE requirements for specific tasks.

B. Switchboards, disconnects, bussplugs, panel boards, industrial control panels, motor control centers, and all other applicable electrical enclosures in our facilities must be labeled to indicate the presence of an arc flash and shock hazard. The labels are required to include, at a minimum, the following information:

- Nominal Voltage
- PPE Category
- Arc Flash Boundary (in inches or feet)

### Sample Equipment Label

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NFPA 70E (2015) provides four (4) PPE categories. PPE Category 1, 2, 3 and 4. PPE Category 0 has been officially eliminated from the standard and is no longer recognized by OSHA or the NFPA as a legitimate PPE Category.

*This company has elected to implement a two (2) category approach to arc flash and electrical PPE compliance. We have selected PPE Category 2 and PPE Category 4.*

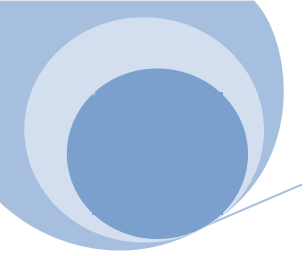
### General Requirements for Proper PPE Usage and Maintenance

The following Personal Protective Equipment requirements are applicable to the category listed:

#### PPE Category 2



|                  |   |
|------------------|---|
| <b>Clothing</b>  | <b>Arc Rated (AR) Long Sleeve Shirt, Pants and Balaclava of at least 8 cal/cm<sup>2</sup></b>   |
| <b>Gloves</b>    | <b>Insulating Rubber Electrical Gloves with Leather Protector Gloves</b>  |
| <b>Other PPE</b> | <b>Safety Glasses, Class E-Rated Hardhat with a Face Shield and Chin Cup of at Least 15 cal/cm<sup>2</sup> ATPV, Ear Plugs, Leather Shoes</b> |
| <b>Tools</b>     | <b>Insulated Tools Only</b>   |



### PPE Category 4



|                  |  |
|------------------|--|
| <b>Clothing</b>  | <b>40 cal/ cm<sup>2</sup> ATPV Arc Rated (AR) Arc Suit</b>                       |
| <b>Gloves</b>    | <b>Insulating Rubber Electrical Gloves with Leather Protector Gloves</b>         |
| <b>Other PPE</b> | <b>40 cm<sup>2</sup> ATPV Arc Hood, Ear Plugs, Leather Shoes, safety glasses</b> |
| <b>Tools</b>     | <b>Insulated Tools Only</b>  |

### Balaclava

A balaclava provides additional head and neck protection which the face shield and hardhat cannot provide alone. The balaclava must be made of Arc-Rated (AR) fabric and is only worn for PPE Category 2 tasks. See picture:



### Undergarments

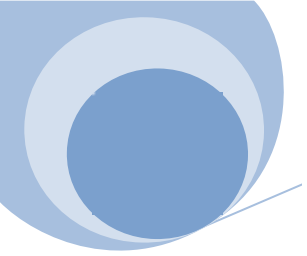
All employees will be properly trained on the importance of wearing ONLY 100% cotton undergarments. Synthetic materials, such as poly/cotton blends, Under Armor, etc., pose a serious burn hazard in the event of an arc flash event. Synthetic fabrics have a low melting threshold and can melt to an employee's skin, even when worn under the proper AR outer garments.

### Wet Weather Gear

Any clothing or protective wear worn over the AR garments, such as wet weather gear, must also be made of arc-rated fabric. Synthetic rain gear, such as traditional nylon rain jackets, ponchos or slickers, pose a serious burn hazard in the event of an arc flash event.

### Cold/Winter Weather Gear

Any clothing or protective wear worn over the AR garments, such as cold weather or winter weather gear (Carhartt jackets, vests, parkas, etc.), must also be made of arc-rated fabric.



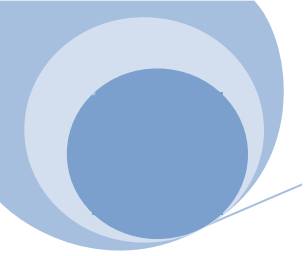
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### AR REMINDER

Any garment that an employee wears while performing live electrical tasks are required to be made of AR fabric. The only exception to this is the undergarments which are required to be 100% cotton.

### Requirements for Proper PPE Usage and Maintenance

- A. Protective equipment must be stored and used in accordance with manufacturer's recommendations. Regular tests and inspections will be required to ensure that any equipment is still fit for purpose and use. Equipment can include but is not limited to voltage-rated gloves, arc-rated hard hats and face shields, safety glasses, hearing protection, safety footwear and arc-rated (AR) clothing.
- B. All Arc-Rated Clothing (ARC) must be laundered and maintained according to the manufacturer's specifications. Employees are not permitted to make alterations to any AR apparel. It is recommended that a uniform company be contacted to discuss the proper care and maintenance/laundrying/repair of the AR garments.
- C. In addition to the arc-rated clothing, applicable employees will also be provided with insulated hand tools, arc-rated hardhat and face shield, and electrically-insulated rubber gloves.
- D. It is recommended that Class 00 gloves be provided to each qualified person. Class 00 gloves, along with the leather protector gloves, when worn in tandem, provide the necessary protection from electrocution and arc flash energy. Bear in mind that Class 00 gloves only provide voltage protection up to 500V. If exposures of greater than 500V are anticipated, gloves with higher voltage protection must be required.
- E. Electrically-insulated rubber gloves are required to be inspected each day (prior to use) by the qualified employee, and tested every six (6) months by a certified third party. The certified third party must mark each glove with their company name and the date of the inspection.
- F. Any additional PPE (fall protection, cut protection, eye protection, etc.) must be determined by a PPE risk assessment of the task.
- G. Prior to establishing an electrically safe work condition, all qualified persons within the flash protection boundary of a presumed live component must be suitably protected with personal protective equipment for that specific hazard category. Once an electrically safe work condition has been established and verified, electrical personal protective equipment can be removed.
- H. Conductive articles of clothing or jewelry (such as watchbands, bracelets, rings, key chains, pens, necklaces, metalized aprons cloth with conductive thread, metal headgear, metal frame glasses, etc.) must not be worn where they present an electrical contact hazard with live parts, unless they are rendered non-conductive by covering or wrapping with insulated material.
- I. All unqualified personnel must be kept a safe distance from exposed energized components. Safe distance must be the longer of the two boundaries (Shock and Flash Protection).



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### 6.10 Insulated Tools and Materials

- Only insulated tools and equipment must be used when exposed to energized parts.
- Insulated tools must be rated for the voltages on which they are used.
- Insulated tools must be designed and constructed for the environment to which they are exposed and the manner in which they are used.
- Fuse or fuse holder handling equipment, insulated for the circuit voltage, must be used to removed or install a fuse if the fuse terminals are energized.
- Ropes and hand-lines used near exposed energized parts must be nonconductive.
- Portable ladders used for electrical work must have nonconductive side rails.

### 6.11 Access-Limiting Equipment

- Barricades must be used in conjunction with safety signs to prevent or limit access to work areas containing live parts. Conductive barricades must not be used where they might cause an electrical hazard. These barricades are designed to prevent un-qualified and/or unprotected workers from entering the electrical hazard area.
- If signs and barricades do not provide sufficient protection, an attendant will be assigned to warn and protect pedestrians. The primary duty of the attendant must be to keep an unqualified person out of the work area where an electrical hazard exists. The attendant must remain in the area as long as there is a potential exposure to electrical hazards.

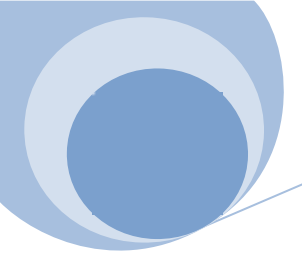
### 6.12 Working Space around Electric Equipment Spaces around Electric Equipment

- Sufficient access and working space must be provided and maintained about all electric equipment to permit ready and safe operating and maintenance of such equipment. Enclosures that house electric apparatus and are controlled by lock and key must be considered accessible to qualified persons.

#### Working Spaces

| Nominal Voltage to Ground | Minimum Clear Distance |              |              |
|---------------------------|------------------------|--------------|--------------|
|                           | Condition 1            | Condition 2  | Condition 3  |
| 0-150                     | 900mm(3 ft)            | 900 mm(3 ft) | 900mm(3 ft)  |
| 151-600                   | 900mm(3 ft)            | 1m(3-1/2 ft) | 1.2 m (4 ft) |

#### Illumination



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- Illumination must be provided for all working spaces about service equipment, switchboards, panel boards, or motor control centers installed indoors. Additional lighting outlets must not be required where the work space is illuminated by an adjacent light source. In electrical equipment rooms, the illumination must not be controlled by automatic means only.

### Dedicated Equipment Space

- All switchboards, panel boards, distribution boards, and motor control centers must be located in dedicated spaces and protected from damage. *Exception: Control equipment that by its very nature or because of other rules of the standard must be adjacent to or within sight of the operating machinery must be permitted in those locations.*

## 7.0 TRAINING REQUIREMENTS

### Requirements

A job briefing should be held before starting each job and include all employees involved. The briefing should cover hazards associated with the job, work procedures involved, special precautions, energy source controls, PPE requirements, and the information on the energized electrical work permit, if required. Additional job briefings shall be held if changes that might affect the safety of employees occur during the course of work.

Workers near energized, or potentially energized electrical circuitry of fifty (50) volts to ground or greater, must be trained in energized electrical safe work practices and procedures and retrained as necessary.

Training will be conducted for all affected employees at no more than 3 year intervals or when changes have been made to the respective codes.

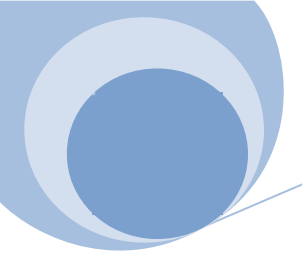
### Qualified Electrical Worker

Employees must receive training in avoiding the electrical hazards associated with working on or near exposed energized parts prior to performing energized electrical work. Such training will be provided when the employee is initially assigned to the job and refresher training will be provided annually or when conditions change.

The following items are to be included in the training of Qualified Electrical Workers:

- The Lockout/Tagout Training Program including safe work practices required to safely de-energize electrical equipment.
- Universal electrical safety procedures.
- Skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
- Skills and techniques necessary to determine the nominal voltage of exposed live parts.
- Selection and use of proper work practices, personal protective equipment, tools, insulating and shielding materials and equipment for working on or near energized parts.
- Skills and techniques necessary to determine proper approach distances as specified in Tables 130.4(C)(a) and 130.4(C)(b).limited





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- Recognition of electrical shock and electrical arc flash/blast hazard potentials, how to minimize the risk of arc flash incidents, and the proper care and maintenance of arc flash PPE.
- Our company will have employees trained in recognizing signs and symptoms of electric shock, heart fibrillation, electric burns, and proper first aid protocols for these conditions. They must have the following training:
- Contacting emergency personnel and basic first aid.

### Employee Retraining

Qualified employees must be retrained if any of the following conditions exist:

- If supervision and or annual inspection reveals, or whenever there is a reason to believe, there are inadequacies in the employee's knowledge of proper electrical safety procedures;
- There is a change in job assignment, a change in machinery, equipment or processes that present new hazard(s), or there is a change in the energy control procedure.

### PROGRAM REVIEW

This program will be reviewed at least annually by the Supervisors and the Safety Manager and updated as necessary.

The annual review includes the following:

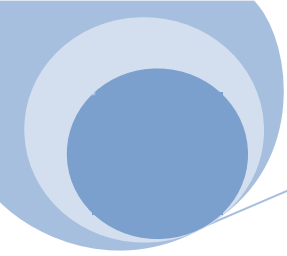
- Review all electrical practices and procedures to determine compliance with this program.
- Review any updated OSHA, NFPA and/or industry data to help improve the overall program.
- Review all accidents or incidents, and update procedures to minimize the risk of those types of accidents or incidents from occurring.
- Evaluate the efficacy of the procedures specified in this program in the context of work activities, and update as necessary.

### 8. Recordkeeping Requirements

- Training records should be made available as needed. Information to include the date, location, instructor, content of course, name, and signature of trainee, etc.- Individual training records must be maintained for the duration of the employee's employment with ABM.
- Completed Authorized and Qualified Employee Roster should be maintained at the site level by the manager at the client's jobsite. These records need to be kept current for the duration of the business at the account.

### 9. References

- 29 CFR §1910.269 - OSHA's Electric Power Generation, Transmission, and Distribution
- NFPA 70E, Standard for Electrical Safety in the Workplace, 2015 edition
- Control of Hazardous Energy Sources - Lockout/Tagout -29 CFR OSHA §1910.147.
- Federal Occupational Safety and Health Administration Standards (OSHA) bases its electrical safety standards (found in 29 CFR Part 1910 Subpart S and 29 CFR Part 1926 Subpart K).



# ABM Technical Addendum

## Electrical Power Solutions Specific Practices

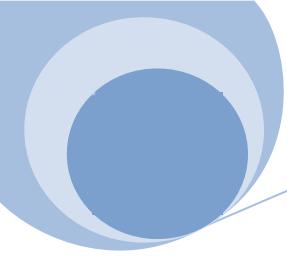
### 1. ELECTRICAL TESTING (GENERAL)

**NOTE: Always test the equipment for absence of voltage before touching.**

When performing electrical tests at any voltage, in addition to other instructions elsewhere in this manual, the following precautions will be taken:

1. When performing tests, test personnel will see that all non-testing personnel and the public are protected from the test voltage by the use of suitable barriers and/or danger signs.
2. Always wear appropriate PPE while performing testing functions. REFERENCE: NFPA-70E
3. Make certain that all temporary leads are securely supported.
4. When testing the resistance of a ground connected to energized equipment, each employee when making and changing connections or testing, will wear approved rubber insulating gloves with leather protectors rated for the voltage involved.
5. When electrical testing requires that circuits or equipment not be grounded, a ground will first be applied and then temporarily removed during the test only.
6. Unauthorized personnel will not enter a test area.
7. Only authorized employees will operate and maintain test equipment.
8. The employee in charge of performing the test on de-energized conductors or equipment will have proper clearance, ascertain that voltage no-test is made and protective ground applied before connecting the test equipment.
9. Employees operating dielectric strength testing equipment having ungrounded metallic cases will wear approved insulating rubber gloves with leather protectors.
10. Employees handling electrodes of dielectric strength testing equipment, other types of voltage inducing equipment or earth probes to detect leakage voltage from faulty buried cables without insulated handles will wear approved insulating rubber gloves with leather protectors.
11. Employees handling current pick-up devices applied to cable sheaths for fault locating will wear approved rubber gloves.
12. Upon completion of electrical testing, the test equipment and equipment tested will be effectively grounded to remove charging current.
13. When testing and/or performing maintenance on draw-out type circuit breakers, breakers will be meggered across open contacts as a last step before racking breaker into its compartment to ensure there are no shorts across the phase bars.
14. All tools used during the testing and/or maintenance procedures must be accounted for before completing the job.





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## Electrical Power Solutions Specific Practices

### 2. Battery Testing Safety Guidelines

**General:** The following equipment is necessary for the safe handling of batteries.

1. Safety glasses
2. Face shield
3. Rubber apron and gloves
4. 4 oz. Squeeze bottle eye wash

**2.1 Personnel Protection:** When handling batteries and taking specific gravity readings, safety glasses, face shield, rubber gloves and rubber apron should be worn. Safety glasses and a face shield should be worn when taking voltage readings. **Never** smoke near batteries.

#### 2.2 Cable/High Potential Testing

**General:** All methods of assuring that no personnel can come into contact with devices under test should be employed. This includes barriers, tape, personnel, etc.

#### 2.3 Double Insulation Testing

**General:** All methods of assuring that no personnel can come into contact with devices under test should be employed. This includes barriers, tape, personnel, etc.

**2.4 Local Operator's Switch and Extension Safety Switch:** At no time should either one of these safety switches be defeated to operate the Doble test equipment. Do not short the safety switches. Do not mechanically lock either switch. Doble testing is a two person job at all times.

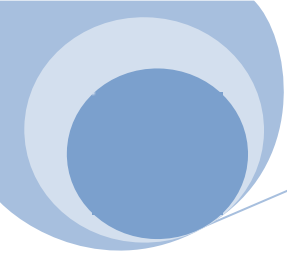
**2.5 Test Leads:** Connect the ground lead to the ground first and then attach to test set. All test leads should be connected to the test set and then to the device under test.

#### 2.6 Safety Grounding (Temporary Grounding)

**General:** When connecting temporary grounds on de-energized equipment, the following procedures should be followed:

##### Procedures

1. All temporary grounding applications should be performed with rubber safety gloves, safety glasses, and a hard hat. These requirements apply to low voltage equipment also (i.e., 480V and below). All temporary grounding should be performed under the direction of the supervisor on the job and noted on the switching, blocking (lockout – tagout) document.
2. Test the equipment to be grounded to assure it is de-energized.
3. Inspect the temporary grounding equipment for voids in the insulation. Assure all mechanical locking devices are operating correctly. Do not use any grounding equipment that is damaged in any way.
4. Connect the temporary grounds to a grounding conductor, ground rod or ground bus.
5. After a connection to ground has been made, then attach the temporary grounds to the conductors to be grounded, using a live line tool.



# ABM Technical Addendum

## Electrical Power Solutions Specific Practices



6. The job leader will count the grounds used, and insure all grounds are removed before equipment is re-energized. This step should also be noted on the (lockout – tagout) document.
7. Red flagging tape will be applied to all installed temporary grounds and pulled outside of equipment as a visual identifier of where grounds are installed.
8. When transferring oil, bond the drums, tanker, pump and hose connections to prevent the build-up of an electrostatic charge and potential for explosion.

### 2.7 Switching

Typically ABM EPS employees should refrain from switching customer’s equipment. When necessary the customer should supply the switching plan.

**General:** (A) When it is necessary for ABM EPS employees to switch, all switching should be performed with the appropriate personal protective equipment as recommended in the latest version of publication NFPA– 70E. When switching devices with control handles, rubber gloves are not required. Always use rubber gloves and leather protectors when switching via mechanisms which could be directly energized. These requirements do apply to low voltage equipment also (i.e., 480V and below). All switching should be performed under the direction of the job leader on the job.

### 2.8 Work in Outdoor Substations and Switchyards

When employees are required to work in outdoor switchyards with energized overhead bus, the following precautions should be taken: When working on a de-energized circuit breaker, and there are other like devices in the station which are energized, the energized devices should be barricaded with safety/caution tape, access will be limited (one way in and out). This will alert employees of the energized devices and prevent inadvertent contact by mistaking an energized device for the de-energized device.

### 2.9 Test Set Connections

**General:** When it is necessary to connect test equipment to energized bus or equipment, all personnel should wear rubber safety gloves, safety glasses, hard hats, Nomex coveralls and/or an appropriately rated blast suit.

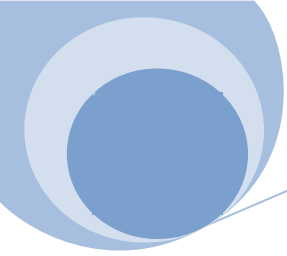
### 2.10 Voltage Detection

**General:** When using statiscopes and phasing meters, these devices must be tested for proper operation before and immediately after the test.

### 2.11 Network Protectors & Network Transformers

**2.11.1** Employees will not close network protectors manually unless the employee has determined that the primary feeder is in service and the transformer is energized with proper phase relation.

**2.11.2** On the first trial operation and/or the first operation of a network protector following repairs, the door of the compartment will be closed. The door of the compartment will be closed during normal or any operations where secondary load is involved.



# ABM Technical Addendum

## Electrical Power Solutions Specific Practices



**2.11.3** Before installing or removing secondary fuses in 125/216 volt network protectors, the protector will be made inoperative to prevent reclosing. Before installing or removing secondary fuses in 277/480 volt network protectors, the primary circuit will be de-energized if permission can be obtained from the Owner. The protector will be made inoperative to prevent reclosing. If it is necessary to remove the network protector mechanism, the primary circuit will be de-energized and the protector will be made inoperative to prevent automatic reclosing. Secondary fuses should be removed before other work is performed.

**2.11.4** No primary switch on network transformers will be operated or primary fuse compartment opened until the primary circuit has been de-energized and the network protectors are in the open position. In addition, the employee designated to operate the primary switch will make certain:

1. That designated employee is at the correct location.
2. That the tags on the feeder cable and equipment in the manhole or vault bear the same number as specified in orders.

**2.11.5** Before performing any work inside 4,000 volt fuse compartments, on the secondary side of 2500 KVA unit substations, both primary and secondary circuits must be de-energized.

### **2.12 Personal Flotation Devices (PFD's)**

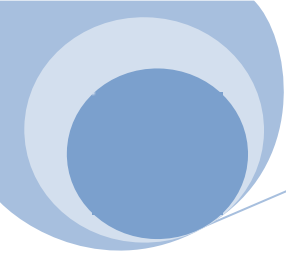
**2.12.1** All employees who are engaged in work in which they may fall or be pulled into the water, will be provided with and directed to use personal flotation devices. This includes, but is not limited to work in shipyards, on/under bridges and vessels.

**2.12.2** PFD's (life preservers, life jackets, and/or work vests) worn by each affected employee must be United States Coast Guard approved pursuant to 46CFR Part 160 (Type I, II, III, or V PFD) and marked for use as work vest, for commercial use, or for use on vessels.

**2.12.3** Personal floatation devices shall be maintained in safe condition and shall be considered unserviceable when damaged so as to affect buoyancy or fastening capability.

**2.12.4** A US Coast Guard approved 30 inch life ring with at least 90 ft. of line attached, will be available at readily accessible points at each waterside work area where employees work exposes them to the hazard of drowning. Employees working on any bridge or structure leading to a detached vessel berthing installation shall wear U.S. Coast Guard approved personal flotation devices except where protected by railings, nets or safety harnesses and lifelines. A readily available ladder giving access to the water shall also be provided within 200 ft. of such work areas.

**2.12.5** Prior to and after each use, the buoyant work vests or life preservers shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.



# ABM Technical Addendum

## Electrical Power Solutions Specific Practices



### 2-13 RUBBER PROTECTIVE EQUIPMENT – GENERAL 2-2.13.1 Rubber Gloves:

1. Approved Low Voltage:
  - a. Low voltage rubber gloves are issued for certain types of work on conductors or equipment that is energized at 500 volts or less, phase to phase.
  - b. Low voltage rubber gloves will not be used on overhead lines, or on voltage in excess of 500 volts phase to phase.
  - c. Only employees issued low voltage (class 00) gloves will use them; employees who are not issued low voltage gloves will not use someone else's except in an emergency.

### 2.13.2 Approved High Voltage:

1. High voltage rubber gloves will be worn while working on, above or near all conductors or equipment energized at 600 to 15,000 volts phase to phase.
2. High voltage rubber gloves will be worn while working on, above, or near conductors or equipment energized below 600 volts, unless specific operating instructions permit the use of low voltage gloves (class 00).
3. High voltage rubber gloves will be worn while grounding.

### 2.13.3 High voltage rubber gloves will:

***Rubber gloves will be inspected and air tested before each use.***

1. Be worn when handling poles or structures being installed or removed adjacent to energized lines. This also includes handling cant hooks, etc.
2. Be worn when testing, connecting, or disconnecting grounds.
3. Not be used when turned inside out.
4. Not be used without protective covers. Such covers will not be used as work gloves until wear has made them unsuitable for use with rubber gloves.
5. All rubber gloves will be tested every six months by the test lab. A tracking schedule has been established. It is in a file titled "Electrical Protective Equipment Testing Records". The master record will be kept by the Safety Director on the ABM Server in Baltimore. The Safety Director will send notices to the Region offices prior to the next due date for required testing.

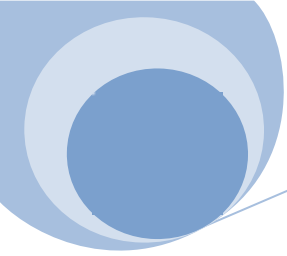
### 2.13.4 Rubber Sleeves – Approved High

***Rubber sleeves will be inspected and air tested before each use.***

Rubber sleeves must be worn outside of other garments, such as jackets, coats, etc. Rubber sleeves must be worn when working within 3ft. of energized conductors or equipment energized at 480 volts and above.

### 2.13.5 Other Rubber Protective Equipment

1. This equipment will be placed so as to adequately cover all energized conductors or equipment, neutral conductors, guy wires, ground wires, and foreign wires in the working zone within reaching distance.



# ABM Technical Addendum

## Electrical Power Solutions Specific Practices



2. Rubber devices will not be folded, but rolled and will be kept in a cool, dry, clean place that is free of oil, acids, and alkalis and will be guarded against damage from heavy concentrations of ozone and from being cut by tools or other material.
3. Rubber gloves will be inspected and air tested before each use.
4. Will be inspected before each use:
  - Blankets.
  - Line hose.
  - Hoods.
  - Jumpers, etc.
5. Rubber gloves and sleeves will be kept in an approved glove/sleeve bag when not in use. This approved bag will not be used for any other purpose.
6. All rubber protective equipment listed in paragraphs 3 through 6 will be turned in for electrical testing in accordance with established schedules.

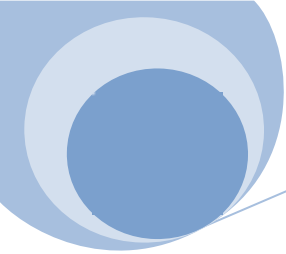
### 2.13.6 Gloving – 15kV

Authorized employees may perform work on electrical conductors and equipment energized at voltages between 6,000 volts phase to ground, 8,700 volts phase to ground or 15,000 volts phase to phase, using Class 3 rubber gloves and rubber sleeves under the following conditions.

- a. From the basket of an aerial lift.
- b. From an insulated platform not less than 40 inches in length and equipped with staging, provided the line mechanic's safety belt can be attached to the staging.
- c. From an insulated ladder, provided:
  - The line mechanic's safety belt can be attached to the ladder.
  - Access to and from the ladder is made in a clear space away from energized conductors and equipment.
  - The ladder is secured and positioned in such a manner that the employee can maintain a working position on the ladder a safe distance from pole, structures, crossarms, guys, conductors, etc., not adequately covered with protective equipment.
  - Employees working from an approved insulated platform will keep their feet within the staging supports and must have safety straps attached to the staging.

### 2.14 TAILGATE CONFERENCE (“Always” conducted in 3 part communication)

**2.14.1** Tailgate Conferences will be conducted by the job leader prior to the start of each job, or at any time during an existing job where significant changes might affect the safety of the employees or at any time a new employee arrives at the job site.



# ABM Technical Addendum

## Electrical Power Solutions Specific Practices



**2.13.2** The keys for a good tailgate conference are:

T - Talk about the job.

A - Assign employees specific duties.

I - Identify known hazards.

L - Let employees know what is expected

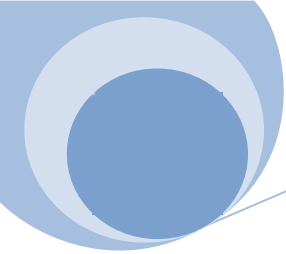
G - Guard against creating additional hazards.

A - Allow time to do the job safely.

T - Thoroughly review safety rules and personal protective equipment to be used.

E - Evaluate each employees understanding.





# ABM Technical Addendum

## Electrical Power Solutions Specific Practices



### Tailgate Meeting Checklist

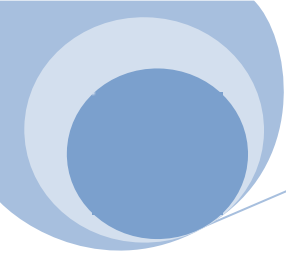
| <b>SAFETY IS PART OF THIS JOB-TAILGATE MEETING CHECKLIST</b> |                          |                          |                          |  |
|--|--------------------------|--------------------------|--------------------------|--|
|  | YES                      | NO                       | N/A                      |  |
|  |                          |                          |                          | <b>PERSONAL PROTECTIVE EQUIPMENT</b>   |
| 1.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Does every employee who is required, have on F.R. Uniform?   |
| 2.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do we have our eye protection, safety goggles, shield if required?   |
| 3.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Head protection?   |
| 4.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Safety shoes?  |
| 5.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Hearing protection plugs or muffs?   |
| 6.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Dust/chemical respirators or breathing apparatus needed?   |
| 7.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Fall protection, belts or harnesses?   |
| 8.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Additional protection for hands, feet, legs, arms, coveralls?  |
| 9.   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do you know your PPE limitations?  |
|  |                          |                          |                          | <b>ENVIRONMENTAL CONDITIONS</b>  |
| 10.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have we walked the clearance to make sure it is correctly tagged and in the condition we requested?                    |
| 11.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are other crews working on or in close proximity to our job area and are they aware of our presence?                   |
| 12.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are work areas protective devices properly placed?   |
| 13.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Any enclosed areas, chemical, asbestos, or PCB exposure hazards?   |
| 14.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Any special abnormal conditions present, high temperatures, pressures, vacuums, etc?                                   |
|  |                          |                          |                          | <b>TOOLS</b>   |
| 15.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Tools, equipment on the job and in good condition?   |
| 16.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Instruments charged and calibrated, especially gas detectors?  |
| 17.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Lifting devices for rescue and/or to prevent back injury?  |
| 18.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Additional barrier cones, signs, tape needed?  |
| 19.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | End of job -site inspection and all tools, materials and temporary grounds used are removed?                           |
|  |                          |                          |                          | <b>PROCEDURES</b>  |
| 20.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have we read the lock out-tagout, drawing/job sheet completely?  |
| 21.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Any special procedures required for switching/operating?   |
| 22.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are appropriate designated authorities aware of our presence?  |
| 23.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is the appropriate number of grounds properly placed?  |
| 24.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | We have reviewed chemical hazard if using them.  |
| 25.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have we reviewed work procedures and the scope of the job?   |
| 26.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | We will report clear upon completion of our job.   |
|  |                          |                          |                          | <b>HOUSEKEEPING</b>  |
| 27.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Slipping, tripping, falling hazards discussed?   |
| 28.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have lighting requirements, safe service for cords, hoses, etc., been met?   |
| 29.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are proper containers for generated wastes on site with labels and paperwork?  |
| 30.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clean up after the job is required. Credit back excess materials and properly dispose of your wastes after completion. |
| 31.  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Turn in all reports ASAP following the job.  |

DRAWING/JOB/WORK ORDER# \_\_\_\_\_ LOCATION \_\_\_\_\_

JOB LEADER \_\_\_\_\_ DATE \_\_\_\_\_

COMMENTS: \_\_\_\_\_

Return completed Sheet with your Daily Time Sheet and Interim Report.



# ABM Technical Addendum

## Electrical Power Solutions Specific Practices



Meeting Attendee Sign in Sheet (use multiple if required). All meeting attendees must sign.

| Printed Name | Signature |
|--------------|-----------|
| 1.           |           |
| 2.           |           |
| 3.           |           |
| 4.           |           |
| 5.           |           |
| 6.           |           |
| 7.           |           |
| 8.           |           |
| 9.           |           |
| 10.          |           |
| 11.          |           |
| 12.          |           |
| 13.          |           |
| 14.          |           |
| 15.          |           |

Job Name:  
Date:

## Lock Out / Tag Out Program

### 1. Policy

It is the policy of ABM that no employee shall install, service, remove, or perform electrical or mechanical maintenance on any equipment until that equipment is de-energized, all stored hazardous energy has been dissipated, or blocked off, and the equipment has been locked and tagged out.

Employees who fail to follow established written procedures for lockout of equipment, or who fail to take appropriate steps to protect the safety of all persons who are performing work under locked out conditions, are subject to disciplinary action.

### 2. Purpose

The purpose of this program is to establish procedural requirements for all ABM employees for the lockout of energy isolating devices whenever maintenance or servicing is done on equipment. This program is used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

### 3. Scope

This program applies to all ABM Facility Solutions employees performing installation, service, maintenance, or removal of any type of machinery, equipment, or components, in which the unexpected start-up or release of stored energy could cause injury.

### 4. Responsibility

#### Managers

- Ensure that only authorized employees, who are qualified and trained, apply and remove locks and tags. Ensure that employees who are found to have insufficient skills or understanding of LOTO requirements do not perform LOTO until they are retrained.
- Implement, manage, and audit personnel for conformance with the LOTO program.
- Ensure that all safety equipment is stocked, stored and maintained in a state of readiness and is available for employee use.
- Ensure that any deficiencies or deviations found in the working procedures/specifications are corrected.
- Ensure group LOTO procedures are followed and only used when it is infeasible to utilize one lock for one person. Group LOTO can only be used if there is a personnel accountability system in place and the LOTO remains in effect until all personnel working under the group LOTO are accounted for.
- Audit site's program annually to ensure the content of this document and employee practices are current with OSHA regulations and maintains audit documentation.
- Whenever subcontractors or other outside servicing personnel are to be engaged in activities covered by the scope and application of this procedure, Management will ensure the following:
  - Inform the contractor of the site LOTO program and requirements.
  - Ensure that the contractor has and follows a written LOTO program that conforms to this procedure.
  - Ensure that all affected employees are trained on the necessary elements of the contractor program including how to recognize their lockout devices.

#### Supervisors

- Perform Manager delegated duties, as specified above.
- Ensure all authorized employees receive the appropriate level of training and that these employees are provided with the proper equipment and personal protective equipment (PPE) to perform the job safely.

## Lock Out / Tag Out Program

- Perform periodic LOTO inspections on all authorized employees at least once a year, utilizing the Periodic Inspection Checklist for Control of Hazardous Energies form. Any observed deviations from the written lockout procedure or inadequacies in the employee's required knowledge or understanding under the procedure must be noted on the inspection form. Refresher training must be conducted to correct these deficiencies.
- When needed utilize the Abandoned Lock Removal Authorization Form, following all requirements.

### Authorized Employees

- Perform LOTO activities in conformance with the ABM Facility Solutions requirements. If the client's requirements are more stringent, follow client's requirements.
- Retain control of the equipment, system or machinery while a LOTO is in progress and work only under their own lock and tag unless a group LOTO has been authorized.
- Maintain LOTO equipment and tags and personal protective equipment (PPE) in good condition.
- Complete all training required to be authorized to work with specific tools equipment or machinery.

### Affected Employees

- Be aware and knowledgeable of the intent and requirements of the LOTO program.
- Complete required training.
- Be knowledgeable of energies associated with the equipment.

## 5. Definitions

**Affected employee:** An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

**Authorized employee:** A person who locks out or tags out equipment in order to perform service or maintenance on that equipment. An affected employee becomes an authorized employee when that employee's duties include performing service or maintenance covered under this section.

**Capable of being locked out:** An energy-isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy control capability.

**Energized:** Connected to an energy source or containing residual or stored energy.

**Energy isolating device:** A mechanical device that physically prevents the transmission or release of energy, such as: 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.

**Energy source:** Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

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

## Lock Out / Tag Out Program

**Lockout device:** A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

**Normal production operations:** The utilization of a machine or equipment to perform its intended production function.

**Servicing and/or maintenance:** Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

**Re-energize:** Any work performed to prepare a machine or equipment, to perform its normal production or operation.

**Tagout:** The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

**Tagout device:** A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

### 6. Program Requirements

Lockout/tagout is required for service and maintenance operations if the procedures to be performed could involve employee exposure to energized electrical parts, to machinery that could unexpectedly start up, or to a stored energy source on the equipment or machinery.

**Note:** Servicing or maintenance on equipment that is powered through an electrical cord and plug must be worked on with the cord unplugged. The person performing the work must have exclusive control of the plug at all times. If necessary, this can be accomplished by applying some form of a plug lock or cord cap lock-over device that is secured with the worker's personal lock and tag.

#### 6.1 Equipment Specific LOTO Procedures

If equipment specific LOTO procedures are not available from the client, the authorized employee must work with his/her supervisor to assess each piece of equipment to identify potential hazardous energies and to document the energy control procedures.

The following energy sources must be evaluated and controls specified within the equipment-specific LOTO procedure, utilizing the Equipment Specific Lockout/Tagout Procedure Form, or similar format as utilized by the client.

- **All Energy Forms**
  - Use energy isolating devices to physically isolate the equipment from the energy source.

## Lock Out / Tag Out Program

- Be sure to isolate all energy sources secondary as well as main sources.
- **Electrical Energy**
  - Know where all electrical disconnects for a machine are located and lock these out.
  - Stand to the side of electrical switch boxes and face away when turning them off. Use the hand that keeps you well away from the switch.
  - Report any broken disconnects or disconnects that cannot be locked out.
  - Disconnect any batteries supplying the system.
  - Discharge any capacitors that may store residual energy.
  - Install ground wires or operate grounding switches.
  - Never pull an electrical switch while it is under load unless it is designed for that purpose.
  - Never remove a fuse from an energized fuse holder rather than disconnecting the source
  - Never rely on a control switch to lockout a machine
  - Always check electrical with a volt meter to ensure energy is isolated verify that the meter works prior to testing and immediately after testing
- **Hydraulic Energy**
  - Lockout electrical disconnects for the pump motor.
  - Shut off valves to individual machines if the pump supplies more than one machine and the other machines must remain operational.
  - Close and lockout each valve supplying the machine.
  - Block parts that could move from loss of pressure and then relieve residual pressure.
  - Move a machine to its rest position prior to lockout and then relieve residual pressure.
  - Identify and de-energize any accumulators that may be in the system by releasing the stored energy.
  - Cycle a machine after it has been de-energized to release any possible stored energy.
- **Pneumatic Energy**
  - Bleed supply lines and leave valves open.
  - Block parts that could move from loss of pressure
  - Move a machine to its rest position prior to lockout and then relieve residual pressure
  - Relieve pressure on air tanks by using bleed-off valves.
  - Cycle the machine after it has been de-energized to release any possible stored energy
  - Never rely on gauges to determine if an air tank is still under pressure; listen for the discharge of air from the tank.
- **Mechanical Energy**
  - Let moving parts come to a complete stop prior to beginning work on the machine.
  - Release the pressure on springs or block the movement of spring-driven parts.
  - Block or brace parts that could move as a result of gravity.
  - Never insert tools or stops in moving parts of the machine.
- **Thermal Energy**
  - Allow extreme heat or cold to dissipate.
  - Use proper protective clothing if thermal energy cannot be allowed to dissipate
  - Avoid contact with active steam or cold piping systems
- **Chemical Energy**
  - Drain process piping systems and close valves to prevent the flow of hazardous materials.
  - Purge reactor tanks and process lines.
  - Use a blank flange or physically separate lines if a line must be blocked where there is no valve.
  - Use proper protective clothing when working with or around chemicals.

## Lock Out / Tag Out Program

### 6.2 Lockout/Tagout Devices

Locks and tags utilized for LOTO shall not be used for any purpose other than controlling hazardous energies. Lockout and tagout devices must be standardized within the facility in at least one of the following criteria: color, shape, or size.

- **Locks**

- Durable and uniquely identified locks, with a single key, will be available for all authorized employees. The key will remain with the individual who places the lock.
- These locks are not to be used for any other purpose.

- **Tags**

- Durable tags that will not deteriorate under work conditions must be used whenever a lock is placed
- The tags must contain at least the following information:
  - Employee's name
  - Warning against hazardous conditions if the machine or equipment is energized
  - Legend such as the following: Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate
- Wires, tie wraps or cords will be used for securing the tags to the energy control point and must be able to withstand 50 lbs. of force.

- **Additional Lockout Devices**

Additional lockout devices, such as valve, circuit breaker and plug lockouts may be necessary to use in conjunction with the lock and tag.

### 6.3 Sequence of General LOTO Procedure

a. Preparing to Service Equipment

The following steps must be taken by the authorized employee when preparing to service or maintenance equipment that must be locked out:

- (1) Notify all affected employees that servicing or maintenance is required on the equipment and that the equipment must be shut down and locked out to perform the servicing or maintenance.
- (2) Read and understand the equipment specific LOTO instructions (see 6.1). Identify the type and magnitude of the energy that the equipment utilizes, understanding the hazards of the energy and the methods to control the energy.
- (3) If the equipment is operating, shut it down by the normal stopping procedure (depress stop button, open switch, close valve, etc.).
- (4) De-activate the energy isolating device(s) so that the equipment is isolated from the energy source(s).
- (5) Lock out the energy isolating device(s) with assigned individual lock(s).
- (6) Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
- (7) Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate. **Caution:** Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.
- (8) The equipment is now locked out.

b. Restoring Equipment to Service

When the servicing or maintenance is completed and the equipment is ready to return to normal operating condition, the following steps shall be taken:

## Lock Out / Tag Out Program

- (1) Check the equipment and the immediate area around the equipment to ensure that nonessential items have been removed and that the equipment components are operationally intact.
- (2) Check the work area to ensure that all employees have been safely positioned or removed from the area.
- (3) Verify that the controls are in neutral.
- (4) Remove the lockout devices and reenergize the equipment. Note: The removal of some forms of blocking may require reenergization of the equipment before safe removal.
- (5) Notify affected employees that the servicing or maintenance is completed and the equipment is ready to use.

### c. Temporary Reenergization of Equipment for Testing

In situations where LOTO devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions must be followed:

- (1) Clear the machine or equipment of tools and materials;
- (2) Remove employees from the machine or equipment area;
- (3) Remove the lockout or tagout devices;
- (4) Energize and proceed with testing or positioning;
- (5) Deenergize all systems and reapply energy control measures in accordance with the Control of Hazardous Energy Standard to continue the servicing and/or maintenance.

### 6.4 Shift Changes

When the maintenance or servicing of a machine requires that the LOTO continue beyond a normal shift, the steps outlined below must be followed. These steps are also required when individuals performing LOTO must leave work or transfer maintenance responsibility and LOTO to other employees.

- The employee cannot remove his/her lockout or tagout device until the oncoming employee is ready to lockout. A supervisor can supply his lock to provide continuous lockout until the incoming employee is ready to lockout.
- No incoming employee uses the lockout or tagout device of an employee who is leaving.
- In the event of a group lockout/tagout system is being used, the single authorized employee ensures the orderly transfer of the lockout or tagout devices.
- When more than one crew, department, or craft is involved in a LOTO procedure, the single authorized employee for the job-associated lockout/tagout ensures the orderly transfer of the lockout or tagout devices between oncoming employees and employees who are leaving.

### 6.5 Group Lockout/Tagout

When service and/or maintenance are performed by a crew, department, or other group, they will use group lockout/tagout devices in accordance with the methods governing individual procedures. Procedures will include:

- Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock). When more than one group is involved, an authorized employee will be designated to coordinate affected work forces and ensure continuity of protection.
- Each authorized employee shall affix a personal lockout and tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.
- Shift or Personnel Changes: Specific procedures will be utilized during shift or personnel changes to ensure the continuity of lockout/tagout protection, including provision for the orderly transfer of lockout/tagout devices,



## Lock Out / Tag Out Program

and the protection between off going and oncoming employees, to minimize exposure to hazards from the unexpected energization or startup of the equipment, or the release of stored energy.

### 6.6 Abandoned Locks

To remove another person's LOTO device, removal protocol requires that both a supervisor along with an authorized employee complete the "Abandoned Lock Removal Authorization Form". Once the need for lock and tag removal is identified to person's supervisor, the following steps must be taken:

- Attempt to contact the lock/tag owner is documented on the Abandoned Lock Removal Authorization Form.
- An evaluation of the entire system must be made to ensure that an injury cannot occur before the lock is removed (names are documented on the form).
- Supervisor or designee removes the lock (names are documented on the form).
- The site manager must be notified within 24 hours of removal (names are documented on the form).
- If contact cannot be made with the employee of the abandoned lock, the employee and their supervisor must be made aware of the removal and state of the system before beginning the next workday.

### 6.7 Periodic inspections

Periodic inspections are required at least annually to ensure compliance with LOTO operation requirements. The inspections must include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected. A supervisor qualified in LOTO will perform the inspection. The results of the inspection must be document on Appendix B: Periodic Inspection Checklist for Control of Hazardous Energies form.

### EXCEPTION TO LOTO PROCEDURE DOCUMENTATION

LOTO is not required for equipment that has only one electrical energy source and is capable of being unplugged provided that the plug is under the direct control and immediate supervision of the one employee performing the work for the duration of the task. The plug is under the exclusive control of the employee if it is physically in the possession of the employee or in arms reach and in line of sight of the employee.

Employers do not have to document the required procedure for a particular machine or equipment when all of the following elements exist:

1. The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shutdown.
2. The machine or equipment has a single energy source which can be readily identified and isolated.
3. The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment.
4. The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.
5. A single lockout device will achieve a locked-out condition.
6. The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.
7. The servicing or maintenance does not create hazards for other employees.
8. The employer, in utilizing this exception has had no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance.

## Lock Out / Tag Out Program

**Note:** Failure to comply with these procedures for LOTO of equipment, or who fail to take appropriate steps to protect the safety of all persons who are performing work under locked out conditions, are subject to disciplinary action, up to and including termination.

### 7. Training Requirements

- Authorized employees must initially attend and complete the ABM Facility Solutions LOTO training course. Including demonstration of a lockout procedure.
- Authorized employees will receive equipment specific training and certification if applicable.
- Authorized employees must be retrained if:
  - Periodic inspection reveals, or whenever there is a reason to believe, there are inadequacies in the employee's knowledge or use of the LOTO energy control procedure.
  - There is a change in the job assignment, a change in machinery, equipment or processes that present a new hazard, or there is a change in the energy control procedure.
  - Affected employees working in areas where LOTO may be used must be trained in the purpose and use of the Control of Hazardous Energies and be updated as changes in the program or LOTO procedures occur.
  - Affected employees will be instructed about the procedure and the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

### 8. Recordkeeping Requirements

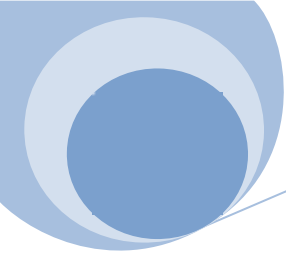
- Employee lockout/tagout training records
- Completed Periodic Inspection Checklist for Control of Hazardous Energies
- Completed Abandoned Lock Removal Authorization Form

### 9. References

29 CFR 1910.147 OSHA's Control of Hazardous Energy – Lockout/Tagout  
ABM Facility Solutions Electrical Safety Program  
ABM Facility Solutions Hazard Communication Program

### 10. Attachments

Appendix A: Equipment Specific Lockout/Tagout Procedures Form  
Appendix B: Abandoned Lock Removal Authorization Form  
Appendix C: Periodic Inspection Checklist for Control of Hazardous Energies



## Lock Out / Tag Out Program

### Attachment A

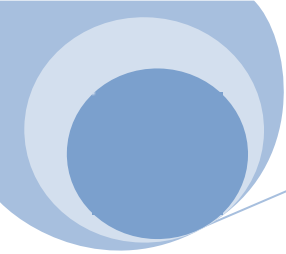
#### Equipment Specific Lockout/Tagout Procedures Form

|                       |  |                       |  |
|-----------------------|--|-----------------------|--|
| <b>Equipment:</b>     |  |                       |  |
| <b>Location:</b>      |  |                       |  |
| <b>Model Number:</b>  |  | <b>Serial Number:</b> |  |
| <b>Revision Date:</b> |  |                       |  |

| NOTICE  |
|---|
| <ul style="list-style-type: none"> <li>• Only trained, authorized employees are allowed to perform work on this equipment.</li> <li>• Equipment may have multiple energy sources. Do not work on equipment unless energy sources are locked out.</li> <li>• When preparing to work on equipment, notify affected personnel and follow the lockout procedures below.</li> <li>• Unless otherwise specified, to restart this equipment, ensure safeguards are replaced, tools and other non-essential items are removed, controls are neutralized, and personnel are clear. Reverse the lockout procedure and notify affected personnel that equipment is operational.</li> </ul> |

*(Insert photos or diagrams of the equipment, lockout locations, etc. that will be useful to the personnel performing the lockout procedure.)*

| Energy Source | Lockout Location | Method | Verify | Lockout Device |
|---------------|------------------|--------|--------|----------------|
|               |                  |        |        |                |
|               |                  |        |        |                |
|               |                  |        |        |                |
|               |                  |        |        |                |
|               |                  |        |        |                |



## Lock Out / Tag Out Program

### Appendix B

#### Abandoned Lock Removal Authorization Form

This form is to be used any time a Lockout/Tagout (LOTO) device is to be removed by someone other than the person who placed the LOTO device. Failure to follow and document the appropriate steps to remove a LOTO device can result in disciplinary action up to and including termination.

Date: \_\_\_\_\_ Time \_\_\_\_\_

1. Name of LOTO device owner whose lock/tag is to be removed: \_\_\_\_\_

2. LOTO device owner's extension/cell/home number:  
\_\_\_\_\_

3. LOTO device owner's First-Line Supervisor or On-Shift Supervisor: \_\_\_\_\_

4. Document attempt to contact LOTO device owner:

| Date/Time | Method of Attempted Contact | Result |
|-----------|-----------------------------|--------|
| 1.        |                             |        |
| 2.        |                             |        |
| 3.        |                             |        |

5. Reason for removing lock (e.g. LOTO device owner called in sick, LOTO device owner forgot to remove lock before leaving site, etc.) \_\_\_\_\_

6. Evaluate the entire affected system to ensure employees' safety before LOTO device is removed.

Removed by: \_\_\_\_\_ Observed by: \_\_\_\_\_

Supervisor's (or designee) Signature Authorized Employee's Signature

7. Site Manager informed (e-mail or phone call/message) that a LOTO device has been removed within 2 hours of removal.

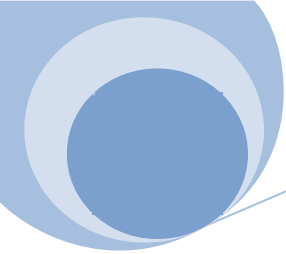
|                           |              |       |       |
|---------------------------|--------------|-------|-------|
| _____                     | _____        | _____ | _____ |
| Facility Manager Notified | How Notified | Date  | Time  |

8. Method of notifying LOTO device original owner and their supervisor that the LOTO device was removed prior to beginning of the device owner's next shift.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# ABM Technical Addendum



## Lock Out / Tag Out Program

### Appendix C

#### Periodic Inspection Checklist for Control of Hazardous Energies

Each authorized employee must be assessed at least annually to verify the accuracy of the LOTO procedure and the understanding of the employee's responsibilities. Any observed deviations from the written lockout procedure or inadequacies in the employee's required knowledge must be noted. Refresher training must be conducted to correct these deficiencies.

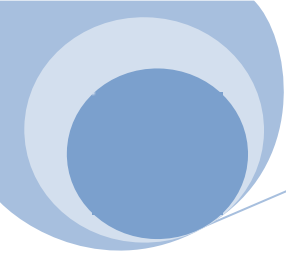
|   |
|---|
| Authorized Employee Being Observed: _____ Date: _____<br>_____  |
| Equipment: _____ Equipment ID #: _____ Location: _____<br>_____ |
| Supervisor Conducting the Inspection: _____<br>_____            |

#### Hazardous Energies Involved:

|                                     |                                    |  |  |
|-------------------------------------|------------------------------------|--|--|
| <input type="checkbox"/> Electrical | <input type="checkbox"/> Hydraulic | <input type="checkbox"/> Chemical                                  | <input type="checkbox"/> Ionizing/Non-Ionizing Radiation |
| <input type="checkbox"/> Mechanical | <input type="checkbox"/> Pneumatic | <input type="checkbox"/> Thermal: High temp _____ Cryogenics _____ |  |
| <input type="checkbox"/> Stored     | <input type="checkbox"/> Vacuum    | <input type="checkbox"/> Other: _____                              |  |

#### Procedural Steps:

| To Lock out the Equipment  | Yes | No | Comments |
|--|-----|----|----------|
| 1) Notified Affected employees in area of LOTO   |     |    |          |
| 2) Identified all specific power disconnect points   |     |    |          |
| 3) Stopped or powered down equipment   |     |    |          |
| 4) Isolated equipment from all hazardous energy sources; number of isolation points: _____                     |     |    |          |
| 5) Applied LOTO device(s) so that the energy-isolating device is locked in the off position.                   |     |    |          |
| 6) Attached LOTO tag to the lock.  |     |    |          |
| 7) Dissipated, drained, or safely released any stored or residual energy if present.                           |     |    |          |
| 8) Blocked mechanical parts; removed mechanical links.   |     |    |          |
| 9) Attempted to re-energize equipment through normal means. Returned switch back to the OFF position.          |     |    |          |
| 10) Verified that no hazardous energies were present or were isolated identify any test equipment/meters used. |     |    |          |
| To Re-Energize The Equipment   | Yes | No | Comments |



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## Lock Out / Tag Out Program

|  |  |  |  |
|--|--|--|--|
| 1) Inspected the work zone to ensure it is clear of equipment, workers, tools, and test equipment. |  |  |  |
| 2) Unlocked and removed any blocking devices and replaced mechanical linkages.                     |  |  |  |
| 3) Repositioned any safety valve(s) left open to prevent re-pressurization.                        |  |  |  |
| 4) Checked that all guarding and safety controls have been properly replaced.                      |  |  |  |
| 5) Warned workers to stay clear of area  |  |  |  |
| 6) Removed all locks and tags from energy control points.  |  |  |  |
| 7) Verified area clear of other personnel.   |  |  |  |
| 8) Restarted/re-energized equipment.   |  |  |  |
| 9) Notified affected personnel and others that the LOTO has been completed.                        |  |  |  |

The results of this inspection were discussed between the Authorized Employee being observed and the Supervisor conducting the inspection.

\_\_\_\_\_

Signature of Authorized Employee Being Observed

Signature of Supervisor Conducting the Inspection

# ABM Technical Addendum

## Refrigerant Management Program



### I. OVERVIEW

This refrigerant management program was developed to meet compliance with current EPA regulations. You should also ensure that you and your employees are following applicable federal and state DOT regulations for the transportation and handling of refrigerants and other hazardous materials. These regulations should be reviewed, along with this program, to ensure compliance.

### II. OVERVIEW OF FEDERAL REGULATIONS

The Clean Air Act (CAA) includes Title VI and many new EPA rules and regulations.

#### Summary of EPA Regulations

1. Prohibition on venting effective July 1, 1992 (40 CFR 82.154).
2. Service practices that maximize the recycling of Class 1 & 2 refrigerants (40 CFR 82.156).
3. Certification program for recovery and recycling equipment (40 CFR 82.158).
4. Certify that service providers have recycling or recovery equipment and are complying with new rules and regulations (40 CFR 82.162).
5. Certification of technicians performing service activities that could potentially release refrigerants into the atmosphere (40 CFR 82.161).
6. Establishment of specific vacuum requirements when opening equipment (40 CFR 82.158).
7. Restrict sale of refrigerants to certified technicians (40 CFR 82.154(n)).
8. Restrict the reuse of recycled or recovered refrigerants to same owner units (40 CFR 82.154).
9. Requirement for owners/operators of units with charges greater than 50 pounds to measure and fix leaks that, over a one-year period, would constitute a specified percentage of the unit's total charge (40 CFR 82.156 (i)(2)).
10. Requirements for disposal of small appliances with refrigerant (40 CFR 82.156).
11. Disposal requirements for special hazardous waste for refrigerants and refrigerant oils (40 CFR 82.1).

#### Summary of EPA Reporting Requirements (40 CFR 82.166)

In order to enforce these regulations, Section 608 of the CAA has the following record-keeping requirements for owners, operators, service providers, and technicians. These records must be kept for three (3) years.

1. Copy of technician's proof of certification
2. Service providers for equipment with greater than 50 pounds of refrigerant must provide owner/operator with service records indicating date, type of service and quantity of refrigerant added.
3. Persons disposing of equipment must maintain records verifying that all refrigerant and oil was removed and who removed it.
4. Owners/operators must keep service records on equipment with greater than 50 pounds of refrigerant indicating date, type of service and quantity of refrigerant added. (Service provider can keep these records for the owner/operator.)
5. Owners/service providers with recovery/recycling equipment must keep a copy of the EPA Refrigerant Recovery or Recycling Device Acquisition Certification Form on file.
6. Owners/operators must keep a copy of any required equipment retirement/replacement plan on file at the site of the equipment.

# ABM Technical Addendum

## Refrigerant Management Program



7. Owners/operators must keep records on any required initial check or follow-up on leak tests.
8. Purchasers of refrigerant must provide to seller evidence of having at least one certified technician for the required type of refrigerant on staff as per the EPA Certified Technician Type I, II, III or IV.

### EPA Audits

To validate that Section 608 is being followed, the EPA conducts on-site audits of owners'/operators' facilities. Prior to these audits the EPA may send a letter requesting that the owner/operator provide certain information, in many cases within 7 days of receiving the letter. An example of the information the EPA has requested in the past is contained in exhibit 1.

### Summary of Final Rule

The final rule establishes new requirements intended to promote proper handling and use of ODSs and HFCs and harmonize refrigerant management requirements across all refrigerant types. The rule contains provisions that affect both owners/operators of refrigerant-containing appliances and the technicians who service them. In particular, the rule:

1. Extends existing requirements of the refrigerant management program toward ODSs to substitute refrigerants such as HFCs. As an example, documentation of amounts of refrigerant removed or added to appliances formerly was required only for ODSs, but is now required for substitute refrigerants, as well.
2. Lowers the leak rate threshold triggering requirement to repair refrigerant-containing equipment containing 50 pounds or more of refrigerant. Beginning January 1, 2019 owners/operators must now identify and repair leaks that exceed 30% for industrial process refrigeration (previously 35%), 20% for commercial refrigeration (previously 35%), and 10% for comfort cooling (previously 15%) within 30 days of when the ODS or substitute refrigerant is added. Leaks must be repaired such that the leak rate is brought below the applicable leak rate.
3. Mandates that beginning January 1, 2019 owners/operators of all three appliance types listed above must perform and document both an initial and follow-up verification test of leak repairs whenever appliances exceed the applicable leak rate. An initial verification test must be performed before any additional refrigerant is added to the appliance. A follow-up verification test must be performed only after the appliance has returned to normal operating characteristics and conditions.
4. Stipulates that verification tests must demonstrate that leaks were successfully repaired. If either the initial or follow-up verification test indicates that repairs were not successful, owners/operators may conduct as many additional repairs and verification tests as needed within the allotted 30-day repair period. The repair period is extended to 120 days if an industrial process shutdown is required. In the event that repair within the applicable timeframe is not feasible, owners/operators of these three appliance types may request limited extensions to the deadline.

States that if the leak rate still cannot be brought below the acceptable threshold, either because the leak cannot be identified or because the appliance still leaks following repairs, owners/operators must create a



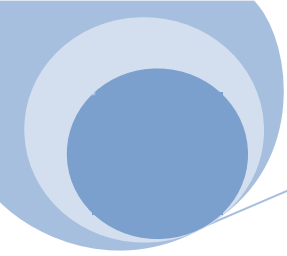
# ABM Technical Addendum

## Refrigerant Management Program



retrofit or retirement plan for the appliances. A retrofit/retirement plan is also required if the owner/operator chooses to retrofit or retire rather than repair the leaks. The retrofit/retirement plan must contain the identification of the appliance, type and full charge of refrigerant used, type and full charge of alternative refrigerant (if retrofitting), plan for

1. disposition of recovered refrigerant, plan for disposition of appliance (if retiring), and a schedule for completion of the retirement or retrofit within one year.
2. Requires owners/operators to conduct leak inspections for appliances that have exceeded applicable threshold leak rate starting on January 1, 2019. All inspections must be conducted by a certified technician and must include all visible components of an appliance. The frequency of leak inspections is determined as follows:
  - a. **Commercial refrigeration and industrial process refrigeration:** Appliances containing 50 to 500 pounds of charge must be inspected once per calendar year until the owner/operator can demonstrate through leak rate calculations that the leak rate has not exceeded 20% (for commercial refrigeration) or 30% (for industrial process refrigeration appliances) for four quarters in a row. Appliances with more than 500 pounds of charge require inspection once every three months.
  - b. **Comfort cooling:** All appliances containing 50 pounds or more of charge must be inspected once per calendar year, until the owner/operator can demonstrate through leak rate calculations that the leak rate has not exceeded 10% for one year.
3. Requires owners/operators to submit reports to the EPA if any appliance containing 50 pounds or more of refrigerant leaks 125% or more of its full charge within one calendar year. The report must document efforts to identify leaks and repair the appliance.
4. Imposes new sales restrictions for refrigerants. Effective since January 1, 2017, recovered ODSs and substitute refrigerants may not be resold unless they were reclaimed by a certified reclaimer, or transferred into equipment belonging to the same owner.
5. Requires owners/operators to maintain hard or electronic copies of the following:
  - a. Documentation of the full charge of appliances.
  - b. Records (such as invoices) showing when service or maintenance is performed, when refrigerant is added or removed, when leak inspections are conducted, and when verification tests are conducted.
  - c. Owners/operators using automatic leak detection systems must document that the system is installed and calibrated annually, and record leaks identified by the monitoring system, including the time and location of the leak.
  - d. Retrofit/retirement plans.
  - e. Requests submitted to EPA to extend repair/retrofit deadlines.
  - f. Documentation of when a system was “mothballed” (temporarily taken out of service) to suspend a repair deadline, if applicable. Corresponding documentation must be maintained when refrigerant is added back into the appliance and it is brought back on-line.
  - g. Records to demonstrate a seasonal variance.
  - h. Reports for appliances identified as leaking 125% or more of their full charge within a calendar year.



# ABM Technical Addendum

## Refrigerant Management Program



Requires technicians to keep records of refrigerant recovered during system disposal from any systems with a 5 to 50-pound charge size. The records must include the location, date of recovery and type of refrigerant recovered for each

1. disposed appliance, the quantity and type of refrigerant recovered within each calendar month, and information about quantities and types of refrigerant shipped for reclamation or destruction, including the party to which the material was transferred. This requirement goes into effect on January 1, 2018.
2. Requires technicians to evacuate ODSs or substitute refrigerants to levels specified in the regulations, using certified recovery/recycling equipment. Technicians evacuating refrigerant from motor vehicle air conditioning (MVAC) appliances must either evacuate the refrigerants or reduce the system pressure to below 102 mm of mercury. This requirement goes into effect on January 1, 2018.
3. The rule does not change certification requirements for currently certified technicians. Starting on January 1, 2018, technicians who have not yet been certified must pass a certification exam updated to reflect the new rule and offered by an approved certification program in order to maintain, service, repair or dispose of appliances containing ODSs or substitute refrigerants. Technicians must maintain a copy of their certificates at their place of business and must maintain a copy until three years after they cease operating as a technician. Apprentice level employees are not allowed to handle refrigerants and or equipment until they become an EPA Certified Technician.

It should be noted that while the rule established greater regulatory reach over many refrigerants not previously addressed under Section 608, it does specifically exempt a number of ODS substitutes, including carbon dioxide, nitrogen and water in any application, and ammonia, chlorine, hydrocarbons, ethane (R-170), propane (R-290) and isobutene and specific applications and appliances.

### III. PROGRAM IMPLEMENTATION OVERVIEW

This program can be implemented by taking the following actions:

1. Develop your company's refrigerant compliance plan and procedures.
2. Use the new service report addendum for units (circuits) with greater than 50 pounds of refrigerant.
3. Use the new 'form letter' to pass important information to customers regarding units that are leaking.
4. Use the new tagging and logging procedures for new refrigerant cylinders, recovery cylinders, recovery equipment, leak rate tracking, and refrigerant purchasing.
5. Implement the use of ABM's Alliance system for refrigerant tracking and or implement another form of digital refrigerant tracking system.

### IV. REFRIGERANT COMPLIANCE PLAN & PROCEDURES DEVELOPMENT

The following policies and procedures constitute an acceptable refrigerant compliance plan that would demonstrate your intent to comply with EPA rules and regulations.

# ABM Technical Addendum

## Refrigerant Management Program

- A. **Federal Regulations.** As stated above, you should have and understand the CAA Title VI Amendments and EPA regulations, plus the penalties and enforcement actions the EPA can take against your company. This information can be found on the EPA Web site, [www.epa.gov/ozone/title6/608/608fact.html](http://www.epa.gov/ozone/title6/608/608fact.html).



- B. **Company Refrigerant Compliance Statement.** Management and technicians are both responsible for compliance with EPA rules and regulations. Ensure every technician agrees to and signs your refrigerant compliance statement.
- C. **Refrigerant Manager.** Identify the person in your company who will have the responsibility of Refrigerant Manager. This person will ensure documentation is maintained accurately and that your company is current on all rules and regulations.

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## Refrigerant Management Program



These responsibilities can be documented as a primary or supplementary objective in the position description for the individual you choose.

- D. **Safety.** Safety is our number one priority, and everyone must follow company and industry safety standards. When handling refrigerant, the following personal protection equipment should be used: safety glasses with side shields, Butile Rubber line or Nitrile gloves, chemical resistant apron, and sturdy work shoes

E. **Technician and Recovery Equipment Records.** The following records should be maintained by the ABM contractor.

1. A copy of every technician's certificate (40 CFR part 82, subpart F) must be kept on file at your office, and each technician must have his certification card on his person while performing service on equipment containing refrigerant. Your copy must be legible and include certification ID. Because these certificates include personal information, they should be kept in a locked filing cabinet. You should keep copies of terminated employees' paperwork for three (3) years.
2. A signed copy of each technician's acknowledgement of your company's policy on compliance and statement that they will not intentionally vent refrigerant (exhibit 2). You should keep copies of terminated employees' paperwork for three (3) years.
3. It is recommended that you have a log of all certified recovery/recycling equipment which includes the serial number of the unit assigned to each technician (see exhibit 3). All recovery/recycling equipment, including gauge sets, must have low loss fittings.
4. You should have on file a copy of your EPA Refrigerant Recovery or Recycling Device Acquisition Certification Form. This form can be found at [www.epa.gov/ozone/title6/608/recoveryform.pdf](http://www.epa.gov/ozone/title6/608/recoveryform.pdf). Note that this is a one-time requirement and does not need to be updated when you add or replace units.

F. **Implementation and Management of Compliance Procedures.** The following steps should be taken to educate employees on compliance procedures, and to evaluate and verify that your procedures are being properly used on an ongoing basis.

1. Training.

Exhibit 12 contains a detailed refrigerant compliance process map that can be used to teach your technicians how to handle a variety of situations. Exhibit 4, the Service Report Addendum (exhibit 4) and the Form Letter (exhibit 5) should be used for proper documentation. The flowchart can be used to demonstrate to customers your process in planning and executing service calls to ensure compliance with current rules and regulations.

You should document that all your employees have attended this training and have a copy of your Compliance Plan and Procedures.

*Note: You may find some steps in the compliance process map that you want to describe in more detail in your Compliance Plan.*

# ABM Technical Addendum

## Refrigerant Management Program



### 2. Evaluation and Verification.

- a. Careful auditing of service reports to ensure they contain all refrigerant transactions and that the form letter and cylinder tracking tags (discussed below) are completed correctly.
- b. Evaluate proper accounting of new and recovered refrigerant by comparing quantities of refrigerant used on service reports with the quantities on the completed 'new refrigerant cylinder tags' and the 'recovered refrigerant cylinder tags' (discussed below).

### G. **Tracking New and Recovered Refrigerant Cylinders.** The following tagging procedures are recommended to accurately track refrigerant.

#### **Purchasing refrigerant**

- Technician contacts local office to acquire a Purchase Order number and a tank tag number
- Office personnel issue Purchase Order number and log the new tank onto the Refrigerant Log also issuing a tank tag number
- Technician completes required information on tag and applies it to tank.

**Note:** If technician is required to purchase refrigerant afterhours, technician must contact office within 24 hours to acquire PO and tank tag number.

#### **Empty tank procedure**

- When new refrigerant tank is depleted, Technician must take photo of completed tank tag
- Technician should send the photo to the office immediately to be associated with the Refrigerant log entry.
- Office attaches photo the Refrigerant Log entry
- Actual tag may be returned to office at later date

#### **Recovery Cylinder procedure**

- Technician must contact office when acquiring empty recovery cylinders to acquire tank tag number
- Office personnel logs the new recovery cylinder on the Refrigerant log and issues tag number to technician
- Technician completes required information on tag and applies it to tank.

#### **Full Recovery Cylinder Procedure**

- When recovery cylinder is at 80% capacity, Technician delivers the cylinder to supplier or shop.
- A photo of the complete tank tag is taken by the technician and sent to the office
- Office associates completed tag with Refrigerant Log entry.
- Actual tag may be returned to office at later date

### H. **Refrigerant Purchasing.** In the event of an audit, the EPA may request a list of all vendors you purchased refrigerant from, and the total quantities purchased. Exhibit 8 has a refrigerant purchase log that allows you to track purchases, vendors and the new refrigerant cylinder tag number. Exhibit 7 "Refrigerant Tracking log" may replace Exhibit 8, Refrigerant tracking log incorporates tank tracking, close out and Purchasing information.

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All refrigerant purchases be made using a company issued PO for the refrigerant only. The new refrigerant cylinder tracking tag number should be annotated on the PO. Requiring PO's for refrigerant purchases creates a better audit trail and ensures that all refrigerant purchased is used by the contractor and not for a technician's personal use.

- I. **Handling of Refrigerant.** No refrigerant cylinder will ever be filled in excess of 80% of capacity. Refrigerant transportation and storage will be in accordance with all federal and state DOT regulations.
- J. **Refrigerant Contamination.** Refrigerants should never be mixed, but instead stored in separate, clean recovery cylinders that are properly marked per ARI Guidelines K and N, and EPA regulations. (Note: If refrigerants are recycled or reclaimed, they are not considered hazardous under federal law. Used oils contaminated with CFCs are not hazardous on the condition that they are not mixed with other waste, are subjected to CFC recycling or reclamation, and are not mixed with used oils from other sources. However, used oils that contain CFCs after the CFC reclamation procedure are subject to specification limits for used oil fuels if these oils are destined for burning. Questions regarding proper handling of these materials can be directed to the EPA's RCRA Hotline at 800-424-9346 or 703-920-9810.)
- K. **Documentation Requirements for Leaks.** An exact description of where the leak is located should be documented on the service report. If a leak exists on a circuit containing greater than 50 pounds, a leak rate calculation must be completed using the following formula, and provided to the owner/operator on the Service Report Addendum (Exhibit 4):

$$\text{Leak Rate} = \text{lbs of Refrigerant added} \times (365 \text{ days} / \text{Full Charge Amount})$$

Owner/operators of equipment with a charge of greater than 50 pounds are required to repair leaks when those leaks together would result in the loss of more than a certain percentage of the equipment's charge over the course of a year. The leak rate trigger for comfort cooling is 10% per year.

The trigger for repair requirements is the current leak rate rather than the total quantity of refrigerant lost. For instance, an owner of an air conditioning system containing 100 pounds of charge must repair a leak if he finds that the system has lost 10 pounds of charge over the past month. Although 10 pounds represents only 10 percent of the system charge in this case, a leak rate of 10 pounds per month would result in the release of more than 100 percent of the charge over the year. To track leak rates, owners of air-conditioning equipment with greater than 50 pounds of charge must keep records of the quantity of refrigerant added to their equipment during servicing and maintenance procedures.

If a unit is leaking, and the leak rate is below the 10% maximum, it is recommended that your technician not add refrigerant. However, the company may allow a technician to add refrigerant if the customer sees the situation as critical, and the unit cannot be repaired in a timely manner and this is a step in calculating the leak rate. Calculating the leak rate, in turn, is considered a step in the process of repairing a leak. The potential problem you face when a leak is not fixed is that during the next service call, more refrigerant is added, and the 10% leak rate is triggered. Regulations require you to look at the date the leak was discovered, which at this point could be more than the 30 days the EPA allows for action to be taken.

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Owner/operators are required to repair leaks within 30 days of discovery. This requirement is waived if, within 30 days of discovery, the owner/operator develops a one-year retrofit or retirement plan for the leaking equipment. If a one-year plan is developed, documentation showing that it is budgeted should be kept on file by the owner/operator. See the “note” on the form letter in exhibit 5, which is used to communicate this requirement to the customer. (Note: Commercial refrigeration and industrial process equipment may qualify for a 120-day repair period if the process must be shutdown. There may be other time extensions, which can be found on the EPA web site for the Compliance Assistance Guidance Document for Leak Repair.)

The form letter in exhibit 5 should be filled out with the customer and a copy left with the customer and one attached to the service report.

- L. **Leak Rate Tag.** It is recommended that a leak rate tag (Exhibit 9) be attached to units (circuits) with greater than 50 pounds of refrigerant. This tag makes the information a technician needs to run a new leak rate readily accessible. It will also quickly indicate if a unit has already reached the maximum leak rate and is either within the 30-day period in which a leak must be fixed or has a replace/retirement plan documented by the customer. Current leak rate information should also be reported on the Service Report Addendum.
- M. **Procedures for Leak Repair and Testing.** A detailed description of the exact location of the repaired leak must be documented on the Service Report. Before conducting a major repair, ensure the equipment is evacuated in accordance with 40 CFR 82.156, Table 1 (Exhibit 10). If the extent of the leak(s) prevents proper evacuation or would contaminate refrigerant being recovered, isolate the leaking component, if possible; evacuate non-leaking components per table 1; then evacuate the leaking component to the lowest level that can be attained without exceeding 0 psi. ABM recommends that stickers or laminated tags be made of table 1 and attached to each piece of recovery/recycling equipment.

When a leak is repaired, this should be indicated on the Service Report. Documentation of the initial or follow-on leak test is not required on comfort cooling equipment; however, comfort cooling equipment owned by the federal government, and industrial process equipment with more than 50 pounds of refrigerant, do require documentation of the initial and follow-on leak test methods and results. The follow-on leak test is required within 30 days. The EPA states that a system need only be operating under normal load conditions for the follow-on test to be performed. Whenever possible, the follow-on leak test will be performed and documented during the same service call, or arrangements made for another service call within 30 days.

Acceptable initial leak test methods include pressurizing, electronic detection, soap bubbles, deep vacuum, nitrogen, and ultrasonic detection. Unacceptable methods include infrared and fluorescent dyes that require refrigerant to be in the system.

The only refrigerant to be used as a trace gas will be HCFC-22, and the system being tested will not be pressurized with HCFC-22 over 10 PSIG. Exceeding this amount will surpass the limit allowed for it to be considered a trace gas. First, use dry nitrogen to increase pressure. Then add trace gas, which should be documented on the Service Report and on the refrigerant tracking tag.

- N. **Documentation of Refrigerant Transactions.** In order to comply with current regulations, you must document all activities associated with refrigerant. This information can be used to demonstrate compliance, and ultimately that no refrigerant

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## Refrigerant Management Program



was intentionally vented. The EPA requires that records be kept for three (3) years. It is recommended that once documents are older than three (3) years they be destroyed.

1. When a circuit has a charge of more than 50 pounds, special reporting requirements exist, and the Service Report Addendum should be used (Exhibit 4). If a leak is discovered, the customer Form Letter (Exhibit 5) must also be completed. A copy of both documents will be left with the customer.
  2. All refrigerant transactions on a circuit with a charge of 50 pounds or more must be reported to an authorized owner/operator representative and include the quantity of refrigerant added and type of service. This includes when refrigerant is recovered and then put back into the same equipment.
  3. If refrigerant is unintentionally released during the service call, the circumstances, amount, and type must be documented on the Service Report Addendum (Exhibit 4).
- O. **Disposal of Equipment.** When equipment will be removed from a customer's site, the Service Report must identify the technician who disposed of the unit and the quantity of refrigerant recovered. The technician must tag the unit, indicating that refrigerant and oil have been properly removed. See Exhibit 11 for a sample disposal tag.

EPA Web site at [www.epa.gov/ozone/title6/608/608fact.html](http://www.epa.gov/ozone/title6/608/608fact.html)

### V. DEFINITIONS

- Accidental Release - the accidental release of a refrigerant to the environment. This does not include "de minimis" releases or releases caused by equipment failures such as failed seals, tubing failure or gasket failure.
- Annual Leak Rate -- the percentage of the total charge of a circuit leaking over a one-year period. The annual leak rate is determined based on the amount of refrigerant added to the circuit.
- Appliance- any type of cooling equipment that uses a Class I or II substance as a refrigerant. Small appliances include water coolers, small refrigeration and window AC units.
- Circuit- a discrete refrigeration system typically consisting of a compressor, evaporator, condenser and associated sub-components. Some appliances contain more than one circuit.
- Class I Refrigerant - substances which are usually chlorofluorocarbons (CFCs).
- Class II Refrigerant - substances which are hydrochlorofluorocarbons (HCFCs).
- Critical Component - a component without which industrial process refrigeration equipment will not function, will be unsafe in its intended environment, and/or will be subject to failures that would cause the industrial process served by the equipment to be unsafe.
- De Minimis Release - small refrigerant releases made in the course of servicing appliances and making good faith attempts to capture or reclaim refrigerant.
- EPA- Environmental Protection Agency.



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## Refrigerant Management Program



- EPA Certified Technician - an individual who has taken and passed an EPA approved training course and test and holds a certification to one of the levels listed below.
  - Type I - servicing of small refrigeration equipment.
  - Type II - servicing or disposing of high-pressure or very high-pressure refrigeration equipment
  - Type III - servicing or disposing of low-pressure refrigeration equipment.
  - Type IV (Universal) - Servicing of all refrigeration equipment types.
- Evacuate -to remove gas from a refrigeration circuit or a portion of a refrigeration circuit to a pressure below atmospheric pressure. Typically done utilizing recovery equipment or a vacuum pump.
- Full Charge - the amount of refrigerant in a circuit required for normal operating conditions.
- High-Pressure Refrigeration Equipment - uses a refrigerant with a boiling point between -50 and 10 degrees centigrade at atmospheric pressure. It includes, but is not limited to, refrigerants 12, 22, 114, 500 or 502.
- Industrial Process Refrigeration - refrigeration systems that are directly linked to an industrial process. An example would be a process chiller where the cooled medium is used to condense water from a process gas stream.
- Industrial Process Shutdown - an industrial process or facility temporarily ceases to operate or manufacture whatever is being produced at the facility.
- Low Pressure Refrigeration - uses a refrigerant with a boiling point above 10 degrees centigrade at atmospheric pressure. It includes, but is not limited to, refrigerants 11, 113 or 123.
- Major Maintenance, Service or Repair- involves removal of compressor, condenser, evaporator, or auxiliary heat exchanger coil.
- Opening - any service, maintenance or repair on an appliance that would release Class I or II refrigerants from the appliance to the atmosphere unless the refrigerants were previously recovered from the appliance.

**Note:** Connecting and disconnecting hoses and gauges to measure pressures, add refrigerants or recover refrigerants is not considered "opening"
- Reclaim Refrigerant-- the process of restoring refrigerant to the purity specified in ARI Standard 700-1993.
- Recover Refrigerant - removal of refrigerant from an appliance and to store it in an external container.
- System Mothballing - intentional shutdown of a refrigeration system undertaken for an extended period of time, where the refrigerant has been evacuated from the appliance or the affected isolated section of the appliance, to at least atmospheric-pressure.
- Test- a method of confirming that a leak has been repaired. EPA regulations require two types of tests, referred to as "verification tests" for equipment containing more than 50 pounds of



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Class I or II refrigerant. There are many methods to perform these tests. The method used shall be based on sound professional judgment.

- Initial Verification Test - those leak tests conducted as soon as practicable after the repair is completed.
  - Follow-up Verification Test – tests that involve checking repairs within 30 days of returning the system to normal operating characteristics or conditions.
- Virgin Refrigerant - refrigerant that has not been used since purchased and is usually contained in a disposable cylinder.

### Exhibit 1

#### Sample of Requirement to Provide Information Letter (Clean Air Act, Section 114(a))

This is a sample of the information an owner/operator of equipment containing refrigerant may have to provide the EPA prior to an audit. In many cases, an owner/operator has seven days to submit this information to the EPA.

#### Questions Pertaining to Section 608 of the Act,

1. Provide the name(s), address(es) and telephone number(s) of all supervisors in the employ of YOUR COMPANY directly in charge of technicians who maintain, service, or repair appliances which contain and use a class I or class II substance as a refrigerant.
2. Provide the name(s), address(es) and telephone number(s) of all technicians employed by YOUR COMPANY who maintain, service, or repair appliances which contain and use a class I or class II substance as a refrigerant.
3. Provide the name of each technician in the employ of YOUR COMPANY and certified by an EPA-approved technician certification program in accordance with 40 CFR Part 82.161(a).
4. Provide the date of certification for each technician referenced in number 3 above, the level of certification, and a copy of each technician's certificate.
5. Provide the name, address, and telephone number of each person, agent, or business entity from whom YOUR COMPANY purchased refrigerant during the above-referenced time frame.
6. State the total number of appliances located at each of the above-referenced facilities which contain and use a class I or class II refrigerant in amounts greater than 50 pounds.
7. For each facility and each appliance referenced in number 6 above, identify whether it is a commercial refrigeration appliance, industrial process refrigeration appliance, comfort cooler, or other types of refrigeration appliance.
8. For each facility and each appliance referenced in numbers 6 and 7 above, state the amount of the full charge of refrigerant, the type of refrigerant used, and the date full charge was determined.
9. For each appliance, provide a description of its location within the specific facility, along with its name, serial number, or other method of identification utilized by YOUR COMPANY and/or its contractors.
10. For each individual appliance, provide copies of any and all work logs, service tickets, invoices, and any other documents maintained by YOUR COMPANY relating to the following:
  - a) Date any and all service was performed:
  - b) Date each leak was discovered:
  - c) Complete, detailed description of all repair work done. (if repairs were not conducted state the reasons therefore):
  - d) Date each repair was conducted:
    - e) Amount of refrigerant added at the completion of each repair.
  - f) Name of the technician who performed the work.
11. For each individual industrial process refrigeration equipment/appliance where repairs were conducted, state whether an initial verification test was conducted, provide the date of said test, and the specific procedures employed to conduct the test. Provide documentation maintained by YOUR COMPANY of said test.
12. For each individual industrial process refrigeration equipment/appliance where repairs were conducted, state whether a follow-up verification test was conducted, provide the date of said test, and the specific procedures employed to conduct the test. Provide documentation maintained by YOUR COMPANY of said test.
13. State whether YOUR COMPANY has developed any retrofit or retirement plan for leaking equipment. If so, provide a dated copy of each plan developed.
14. State whether YOUR COMPANY has mothballed any appliance during above-referenced time frame and the reasons therefore.

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## Refrigerant Management Program



15. State whether all or part of maintenance, service, repair, and disposal of appliances containing a class I or class II refrigerant is contracted out or done in-house.
16. Provide the name, address, and telephone number of each person, agent, or business entity, other than YOUR COMPANY employees, hired to service, repair, maintain, or dispose of equipment containing and using a class I and class II substance as a refrigerant at each of the above-referenced facilities.
17. For each entity identified in number 16 above, provide copies of all work logs, service records, invoices, receipts, and all other documents of service performed and not provided in response to question number 10.

### Questions Pertaining to Section 612 of the Act

18. Identify each unit has been converted to use an alternative refrigerant and the type of refrigerant to which the appliance was converted.
19. Provide the date of each conversion referenced in number 18 above, and the reasons therefore.

### Miscellaneous Questions

20. Verify whether YOUR COMPANY has submitted to the EPA an MVAC Recovery/Recycle or Recover Equipment Certification Form required of businesses that perform services on MVACS and a Refrigerant Recovery or Recycling device Acquisition Form required of businesses that perform service on HVAC appliances.
21. Provide copies of any equipment forms referenced in number 20 above and submitted to the EPA Regional Office in which the facility is located, along with the date of submittal.
22. State the product name, model number, and serial number of any refrigerant recovery system owned and used by YOUR COMPANY at each individual facility where recovery/recycle equipment is located.
23. For all equipment referenced in number 22 above, provide copies of any sales receipts, invoices, and any other document showing date purchased and from whom purchased.
24. Provide copies of all records, including but not limited to, receipts, invoices, purchase orders, or bills of lading, concerning refrigerant purchases or acquisitions during the above-referenced time frame.
25. State the total amount and types of refrigerant in inventory at each facility as of the date of this letter.
26. Provide the name and address of the party who should receive official correspondence on behalf of each facility identified in response to this letter.
27. State whether YOUR COMPANY has a corporate policy regarding maintenance, service, repair, and disposal of appliances. Provide copies of all written policies.

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## Refrigerant Management Program



## Exhibit 2

Dear (employee):

As you are aware, scientific evidence has indicated that the release of CFC's and HCFC's has been identified as a contributing factor to the depletion of the earth's protective ozone layer.

In an effort to protect the earth's environment, the Environmental Protection Agency (EPA) has imposed rules and regulations known as the Clean Air Act Amendments. These rules and regulations have a major impact in our industry and on how we service customers.

The management of (company name) is dedicated to protecting the environment and fully complying with all applicable provisions of Title VI, Section 608 of the Clean Air Act Amendments of 1990 and the Recovery/Recycling regulation of the EPA. We will continue to receive and provide training in all aspects of refrigerant management to assure full compliance. We are committed to continuously improve our internal procedures and will seek new technologies/procedures for refrigerant management as they become available. We also encourage ideas you have for improving our procedures.

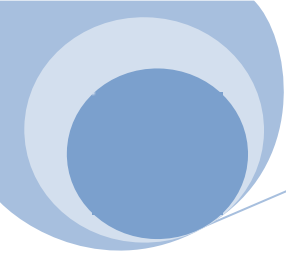
As a service professional in the refrigeration and air conditioning industry, you are in a position to make a positive impact on the future health of our environment. It will begin with a commitment from you to implement proper refrigerant management practices. The responsible service professional will implement the following service practices on a routine basis:

- Do not vent refrigerants to the atmosphere.
- Follow and use recommended service procedures and recovery/recycle equipment for handling refrigerants.
- Evacuate systems in accordance with Table 1 of Section 608.
- Shut down system and repair leaks when they exist.
- Replace and tighten valve seal caps after servicing.
- Recover vapor and liquid from charging hoses.
- Use brazed joints versus flared fittings where possible.
- Use proper initial and follow-up leak testing procedures.
- Confirm the integrity of system tightness by performing a standing vacuum test.
- Use only DOT-approved cylinders and drums for storing refrigerants.
- Properly dispose of used refrigerant containers.
- Add refrigerant carefully to avoid overcharging.
- Inform owner/operator of leaks and when taking refrigerant off their property.
- Insure all refrigerant transactions are accurately documented.

The depletion of the ozone is a serious concern to the future of our environment and by complying with the rules and regulations and implementing solid refrigerant management practices, you will represent the professional image our customers and employees expect from (company name).

Sincerely,

(Principal/General Manager)



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## Refrigerant Management Program



### Exhibit 2 (cont.)

#### REFRIGERANT MANAGEMENT POLICY AGREEMENT

With full consideration of all facts available regarding the effect of CFC's and HCFC's on our environment, (company name) has pledged to fully comply with all applicable provisions of Title VI, Section 608 of the Clean Air Act Amendments of 1990 and the Recovery/Recycling regulation of the EPA.

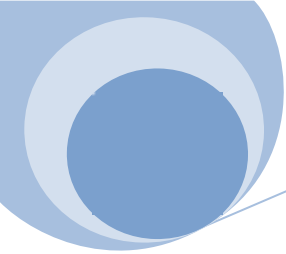
Mandated in Title VI, Section 608 of the Federal Clean Air Act Amendments of 1990 is the ban on intentional venting of CFC's and HCFC's during installation, service and/or repair of refrigeration and air conditioning equipment, effective July 1, 1992. The penalties, rules and regulations for non-compliance apply to (company name) and all its employees. Non-compliance can result in fines and/or jail sentences.

(Company name) technicians will not knowingly vent or otherwise release refrigerant into the atmosphere during the servicing, repair, maintenance, and disposal of air-conditioning and refrigerant equipment. (Company name) has the required recovery/recycle equipment, will provide you with the proper training, and insure you are properly certified in accordance with the EPA Standard 40 CFR 82, Protection of Stratospheric Ozone, Refrigerant Recycling to comply with all federal and state laws. As a Service Representative of (Company name) you are personally responsible for compliance and the proper documentation of all refrigerant transactions. Legal responsibility will be yours in the event you choose to intentionally vent refrigerants, including any ensuing fines. Moreover, non-compliance by employees will not be tolerated and will result in your immediate dismissal.

(Employer)

(Employee)

(Date)



# ABM Technical Addendum

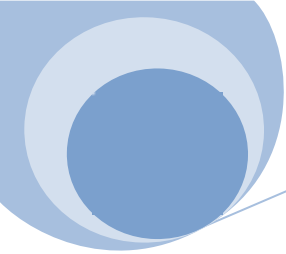
## Refrigerant Management Program



### Exhibit 3

#### Recovery Equipment Log

| Serial # | Model # | Manufacturer | Registration #<br>(per state law) | Active or<br>Passive | Low<br>Loss<br>Fittings? | Internal<br>Filter<br>(model #) | External<br>Filter<br>(model #) | Last<br>Date<br>Serviced | Date<br>Unit<br>Purchased | Date<br>Unit<br>Retired | Assigned<br>To |
|----------|---------|--------------|-----------------------------------|----------------------|--------------------------|---------------------------------|---------------------------------|--------------------------|---------------------------|-------------------------|----------------|
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# ABM Technical Addendum

## Refrigerant Management Program



### Exhibit 4

PAGE 2, SERVICE REPORT (Circuits with greater than 50# of Refrigerant)  
REFRIGERANT MANAGEMENT

|                                  |  |                    |  |
|----------------------------------|--|--------------------|--|
| Call Slip #                      |  | EQ #               |  |
| Coverage Code                    |  | Location           |  |
| ADR/Job/ACCT #                   |  | Manufacturer       |  |
| Employee #                       |  | Model #            |  |
| Date Service Performed           |  | Serial #           |  |
| Is there a FORM LETTER attached? |  | Refrigerant Type   |  |
|                                  |  | Refrigerant Charge |  |

Service Description

Confirm Charge    
  Upgrade Installed    
  Minor Maintenance (e.g. condensing P/A, etc.)    
  Isolated Leak  
 Dispose Of Unit    
  Refrigerant Conversion    
 Major Maintenance (e.g. recovering, compressor, evaporator, etc.)    
 \_\_\_\_\_ Vacuum (Inches/Micro)

| Refrigerant | Cylinder ID | Type | Refrig. Condition | Quantity |     |
|-------------|-------------|------|-------------------|----------|-----|
| Recovered   |             |      |                   | lbs.     | oz. |
|             |             |      |                   | lbs.     | oz. |
|             |             |      |                   | lbs.     | oz. |

Recovery Unit ID # \_\_\_\_\_

| Added | Cylinder ID | Type | Refrig. Condition | Quantity |     |
|-------|-------------|------|-------------------|----------|-----|
|       |             |      |                   | lbs.     | oz. |
|       |             |      |                   | lbs.     | oz. |
|       |             |      |                   | lbs.     | oz. |

Startup Charge Only    
 Net Refrigerant Added: \_\_\_\_\_ lbs. \_\_\_\_\_ oz.

Leak

Leak Found     Date: \_\_\_\_\_     Leak Notes: \_\_\_\_\_  
 (Include location of leak)  
 Leak Repaired     Date: \_\_\_\_\_  
 Initial Leak Test     Date: \_\_\_\_\_  
 (Fed Gov equip/Industrial Process)  
 Method: Pressurizing, Electronic, Ultrasonic, Deep Vacuum, Other  
 Follow-up Test     Date: \_\_\_\_\_  
 (Fed Gov equip/Industrial Process)  
 Method: Pressurizing, Electronic, Ultrasonic, Deep Vacuum, Other

|                 |  |           |  |      |     |
|-----------------|--|-----------|--|------|-----|
| Trace gas used: |  | Quantity: |  | lbs. | oz. |
| Cylinder ID:    |  |           |  |      |     |

Accidental Release Occurred     Description: \_\_\_\_\_

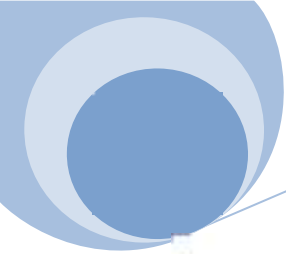
|       |  |                            |  |      |     |
|-------|--|----------------------------|--|------|-----|
| Type: |  | Estimated Amount Released: |  | lbs. | oz. |
|-------|--|----------------------------|--|------|-----|

|                |  |         |           |  |                       |  |
|----------------|--|---------|-----------|--|-----------------------|--|
| Oil Recovered: |  | gallons | Oil Type: |  | Accumulation Drum ID: |  |
|----------------|--|---------|-----------|--|-----------------------|--|

Service Representative

Customer





# ABM Technical Addendum

## Refrigerant Management Program



### Exhibit 5

THIS FORM LETTER INFORMS OWNER OF A REFRIGERANT LEAK, EPA REQUIREMENTS FOR REPAIR, AND TO DEVELOP ACTION PLAN

1. During the conduct of preventive maintenance on your air conditioning equipment, a refrigerant leak was found on unit number \_\_\_\_\_ This unit (circuit) has:

- Greater than
- Less than

50 pounds of refrigerant.

2. Complete section 2A below if the leak CAN be fixed, or section 2B if leak CANNOT be fixed.

2A.  The leak, which **can** be fixed, is on equipment that (choose one): \_\_\_\_\_

- Has
- Has not
- n/a (check if unit has less than 50 pounds of refrigerant)

reached a leak rate of 10%, the maximum allowed by the EPA (see note).

- Your GLP agreement covers this cost and will be completed within the guidelines outlined in note below.
- Your GPM/CPM/SPOT agreement does not cover the cost to make this repair.
- You authorize the repair of this leak.
- You do not authorize the repair of this leak (see note).
- You authorize monitoring the leak rate prior to the next scheduled PM.

2B.  The leak, which **cannot** be fixed\*, is on equipment that (choose one): \_\_\_\_\_

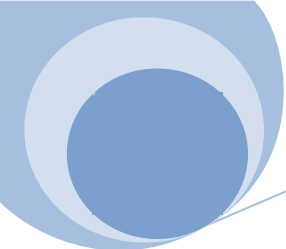
- Has
- Has not
- n/a (check if unit has less than 50 pounds of refrigerant)

reached a leak rate of 10%, the maximum allowed by the EPA (see note).

- Your GLP agreement covers this cost and will be completed within the guidelines in the note below.
- Your GPM/CPM/SPOT agreement does not cover the cost to replace/retire this equipment.
- You authorize the replacement / retirement of this equipment.
- You do not authorize the replacement / retirement of this equipment (see note).
- You authorize monitoring the leak rate prior to the next scheduled PM.

Note: Owners of comfort cooling equipment (circuit) with a refrigerant charge of more than 50 pounds that has reached a leak rate of 10% must repair/replace/retire the equipment within 30 days of the discovery of the leak, or develop a budgeted equipment plan within 30 days of the leak being discovered, documenting that the plan will be executed with 1 year. Owner must keep the budgeted replacement plan on file.

\* Reason leak can not be fixed: \_\_\_\_\_  
 Other comments: \_\_\_\_\_  
 Technician \_\_\_\_\_ Call Slip # \_\_\_\_\_ Contract # \_\_\_\_\_ Date \_\_\_\_\_  
 Customer \_\_\_\_\_



# ABM Technical Addendum

## Refrigerant Management Program



### Exhibit 6

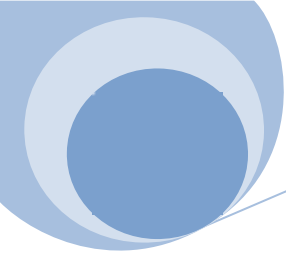
#### Refrigerant Cylinder Tag

**Refrigerant  
Cylinder Tag**

**ABM**  
**BUILDING SOLUTIONS LLC**  
 6200 Goodyear Road • Benicia, CA 94510

24/7 Service  
 707-748-6041

|   |  |  |  |                               |   |   |
|---|--|--|--|-------------------------------|---|---|
| Cylinder ID #   |  |  |  |                               | Recovery Cylinder<br><input type="checkbox"/> Yes <input type="checkbox"/> No |   |
| Technician Name   |  |  |  |                               |   |   |
| Refrigerant Type  |  |  |  | Cylinder Capacity<br>(in lbs) |   |   |
| All weights are for Refrigerant Gas in Cylinder Only. Tare (weight of cylinder) not included. |  |  |  |                               |   | Date                                    |
|   |  |  |  |                               |   | Service Call / Code                     |
|   |  |  |  |                               |   | START<br>Weight<br>lbs / oz             |
|   |  |  |  |                               |   | ADDED (+) or<br>REMOVED (-)<br>lbs / oz |
|   |  |  |  |                               |   | END<br>Weight<br>lbs / oz               |



# ABM Technical Addendum

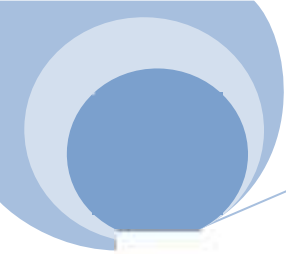
## Refrigerant Management Program



### Exhibit 7

#### Refrigerant Cylinder Log

| Cylinder ID | Date | Description | Manufacturer of Primary Cylinder | Equipment Type | Off to 105 | Qty released to other | Note Tag Returned | Vendor |
|-------------|------|-------------|----------------------------------|----------------|------------|-----------------------|-------------------|--------|
|             |      |             |                                  |                |            |                       |                   |        |
|             |      |             |                                  |                |            |                       |                   |        |
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# ABM Technical Addendum

## Refrigerant Management Program



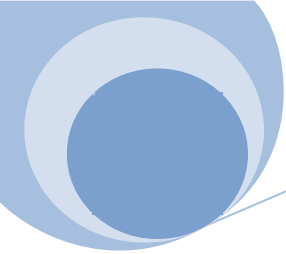
### Exhibit 8

#### Refrigerant Purchase Log

For the Month of \_\_\_\_\_

| Order<br>Date | Refrigerant<br>Type | Cylinder<br>Tag # | Weight<br>Lbs./Gals. | Supplier | Amount of<br>Purchase | Purchase Order<br>Number | Invoice | Receipt<br>Date |
|---------------|---------------------|-------------------|----------------------|----------|-----------------------|--------------------------|---------|-----------------|
|               |                     |                   |                      |          |                       |                          |         |                 |
|               |                     |                   |                      |          |                       |                          |         |                 |
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|               |                     |                   |                      |          |                       |                          |         |                 |

**Total** \_\_\_\_\_



# ABM Technical Addendum

## Refrigerant Management Program



### Exhibit 9

### Leak Rate Tag

FRONT

\_\_\_\_ Service Contractor: Leak Rate Tag

This unit (circuit) contains greater than 50 pounds of refrigerant

Unit # \_\_\_\_\_ Serial # \_\_\_\_\_

Total Charge \_\_\_\_\_ Refrig. Type \_\_\_\_\_

| Date | Call Slip # | Unit Leaking? | Qty of Refrig. Added | Leak Rate |
|------|-------------|---------------|----------------------|-----------|
|      |             |               |                      |           |
|      |             |               |                      |           |
|      |             |               |                      |           |
|      |             |               |                      |           |
|      |             |               |                      |           |
|      |             |               |                      |           |
|      |             |               |                      |           |

BACK

~~Unit Service Contractor: Leak Rate Tag~~

$$\text{Leak Rate} = \frac{(\text{Lbs. of Refrig. Added})}{(\text{Total Charge Amt.})} \times \frac{365 \text{ Days}}{\# \text{ of Days since Last service}}$$

Unit has a 1 year replacement plan documented by customer.  
Unit must be replaced by \_\_\_\_\_

# ABM Technical Addendum

## Refrigerant Management Program

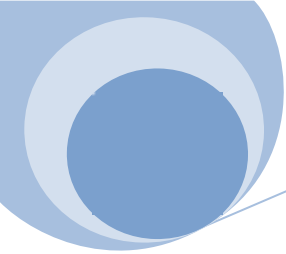


### Exhibit 10

**TABLE 1**  
**Section 903**  
**REQUIRED LEVELS OF REFRIGERANT FOR APPLIANCES**  
**EXCEPT FOR SMALL APPLIANCES, HEAVY, AND RESA-USE APPLIANCES**

| Type of Appliance  | Inches of Mercury Vacuum <sup>**</sup><br>Using Equipment (Standard) |                              |
|--|--|------------------------------|
|  | Before Nov. 15, 1993   | On or after<br>Nov. 15, 1993 |
| HCFC-22 appliance** normally containing less than 200 pounds of refrigerant  | 0  | 0                            |
| HCFC-22 appliance** normally containing 200 pounds or more of refrigerant  | 4  | 10                           |
| Other high-pressure appliance** normally containing less than 200 pounds of refrigerant (CFC-12, -500, -502, -114) | 4  | 60                           |
| Other high-pressure appliance** normally containing 200 pounds or more of refrigerant (CFC-12, -500, -502, -114)   | 4  | 15                           |
| Very High Pressure Appliance (CFC-13, -503)  | 0  | 0                            |
| Low-Pressure Appliance (CFC-11, HCFC-123)  | 25   | 200 mm Hg absolute           |

<sup>\*\*</sup>Relative to standard atmospheric pressure of 29.9" Hg  
<sup>\*\*</sup>Includes component of such an appliance



# ABM Technical Addendum Refrigerant Management Program



## Exhibit 11

### Equipment Disposal Tag

**ALL REFRIGERANT HAS BEEN EXHAUSTED  
FROM THIS UNIT IN ACCORDANCE WITH EPA  
REGULATIONS**

Name of person who Exhausted Unit \_\_\_\_\_

Phone Number \_\_\_\_\_

Date \_\_\_\_\_



# ABM Technical Addendum

## Respiratory Protection Program



### 1. Purpose

ABM has determined that employees in the [Insert Department(s) Name] are exposed to respiratory hazards. These hazards include gases, vapors, fumes, dust and mold. In some cases these hazards may represent Immediately Dangerous to Life (IDLH) conditions. The purpose of this program is to ensure that all ABM employees are protected from exposure to these respiratory hazards.

Engineering controls, such as ventilation and substitution of less toxic materials, are the first line of defense; however, engineering controls have not always been feasible for some of our operations, or have not always completely controlled the identified hazards. In these situations, respirators and other protective equipment must be used. Respirators are also needed to protect employee's health during emergencies. The work processes requiring respirator use at ABM are outlined in Table 1 in the Scope and Application section of this program.

In addition, some employees have expressed a desire to wear respirators during certain operations that do not require respiratory protection. As a general policy ABM will review each of these requests on a case-by-case basis. If the use of respiratory protection in a specific case will not jeopardize the health or safety of the worker(s), ABM will provide respirators for voluntary use. As outlined in the Scope and Application section of this program, voluntary respirator use is subject to certain requirements of this program.

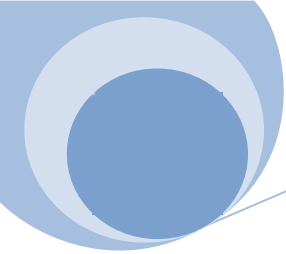
### 2. Scope and Application

This program applies to all employees who are required to wear respirators during normal work operations, and during some non-routine or emergency operations such as a spill of a hazardous substance. This program requires that respiratory equipment will be provided for the employee's when engineering control measures are not feasible to protect them from harmful vapors and oxygen deficient atmospheres. This includes employees in the [Insert Department(s) Name] departments. All employees working in these areas and engaged in certain processes or tasks (as outlined in the table below) must be enrolled in ABM's respiratory protection program. **ABM employees are not authorized to work in IDLH (immediate dangerous to life and health) atmospheres without the approval of the Regional Safety Director.**

Respirators shall be provided which are applicable and suitable for the purposes intended. In addition, any employee who voluntarily wears a respirator when a respirator is not required (i.e., in certain maintenance operations) is subject to the medical evaluation, cleaning, maintenance, and storage elements of this program, and must be provided with certain information specified in this section of the program. Employees who voluntarily wear filtering facepieces (dust masks) are not subject to the medical evaluation, cleaning, storage, and maintenance provisions of this program.

Employees participating in the respiratory protection program do so at no cost to them. The expense associated with training, medical evaluations and respiratory protection equipment will be borne by ABM and [Insert Customer Name].





# ABM Technical Addendum

## Respiratory Protection Program



All respirator training, fit testing, respirator use and maintenance requires employee participation. It is ABM’s goal to make sure that employees understand the importance and proper use of respirators and that all employee questions are answered.

**Table 1: Voluntary and Required Respirator Use at the ABM site at [Insert Customer Name]**

| Respirator | Department/Process |
|------------|--------------------|
|            |                    |
|            |                    |
|            |                    |
|            |                    |
|            |                    |
|            |                    |
|            |                    |
|            |                    |
|            |                    |
|            |                    |

### 3. Responsibilities

#### Program Administrator

The Program Administrator is responsible for administering the Respiratory Protection Program. Program Administrator duties include:

- Identifying work areas, processes or tasks that require workers to wear respirators, and evaluating hazards.
- Selection of respiratory protection options.
- Monitoring respirator use to ensure that respirators are used in accordance with their certifications.
- Arranging for and/or conducting annual training.
- Ensuring proper storage and maintenance of respiratory protection equipment.
- Arranging for qualitative fit testing.
- Arranging for quantitative fit testing.
- Administering the medical surveillance program.
- Maintaining records required by the program.
- Evaluating the program.
- Updating the written program as needed.

The Program Administrator for the ABM at [Insert Customer Name] is the Regional Safety Director who oversees the area wherein the account is located.

# ABM Technical Addendum

## Respiratory Protection Program



### Supervisors

Supervisors are responsible for ensuring that the respiratory protection program is implemented in their particular areas. In addition to being knowledgeable about the program requirements for their own protection, supervisors must also ensure that the program is understood and followed by the employees under their charge. Duties of the supervisor include:

- Ensuring that employees under their supervision (including new hires) have received appropriate annual training, fit testing, and annual medical evaluation.
- Ensuring the availability of appropriate respirators and accessories.
- Being aware of tasks requiring the use of respiratory protection.
- Enforcing the proper use of respiratory protection when necessary.
- Ensuring that respirators are properly cleaned, maintained, and stored according to the respiratory protection plan.
- Ensuring that respirators fit well and do not cause discomfort.
- Continually monitoring work areas and operations to identify respiratory hazards.
- Coordinating with the Program Administrator on how to address respiratory hazards or other concerns regarding the program.

### Employees

Each employee has the responsibility to wear his or her respirator when and where required and in the manner in which they were trained. Each is also required to maintain and care for their respirator. Respirators must be maintained clean and sanitary as outlined in the manufacturer's procedures.

Employees must:

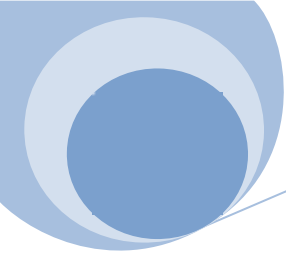
- Care for and maintain their respirators as instructed, and store them in a clean sanitary location.
- Inform their supervisor if the respirator no longer fits well, and request a new one that fits properly.
- Inform their supervisor or the Program Administrator of a respiratory hazard that they feel is not adequately addressed in the workplace and of any other concerns that they have regarding the program.

## 4. Program Elements

### Selection Procedures

The Program Administrator will select respirators to be used on site, based on the hazards to which workers are exposed and in accordance with all OSHA standards. The Program Administrator will conduct a hazard evaluation for each operation, process, or work area where airborne contaminants may be present in routine operations or during an emergency. The hazard evaluation will include:

1. Identification and development of a list of hazardous substances used in the workplace, by department, or work process.



# ABM Technical Addendum

## Respiratory Protection Program



2. Review of work processes to determine where potential exposures to these hazardous substances may occur. This review shall be conducted by surveying the workplace, reviewing process records, and talking with employees and supervisors.

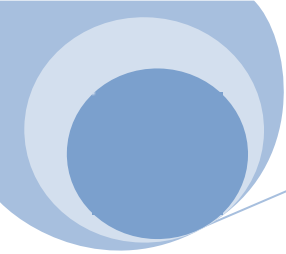
3. Exposure monitoring to quantify potential hazardous exposures.

The results of the current hazard evaluation are the following:

| <b>Table 2: Hazard Evaluation</b> |                   |  |  |   |                            |                 |
|-----------------------------------|-------------------|--|--|---|----------------------------|-----------------|
| <b>Department</b>                 | <b>Operations</b> | <b>Hazard (Gases, vapors, fumes, dust)</b> | <b>Chemical Exposure Level (ppm or mg/m<sup>3</sup>)</b> | <b>Ventilation Adequate as a Control?</b> | <b>Respirator Selected</b> | <b>Comments</b> |
|                                   |                   |  |  |   |                            |                 |
|                                   |                   |  |  |   |                            |                 |
|                                   |                   |  |  |   |                            |                 |
|                                   |                   |  |  |   |                            |                 |
|                                   |                   |  |  |   |                            |                 |
|                                   |                   |  |  |   |                            |                 |
|                                   |                   |  |  |   |                            |                 |
|                                   |                   |  |  |   |                            |                 |
|                                   |                   |  |  |   |                            |                 |

### *Updating the Hazard Assessment*

The Program Administrator must revise and update the Hazard Assessment as needed (i.e., any time work process changes may potentially affect exposure). If an employee feels that respiratory protection is needed during a particular activity, he/she is to contact his or her supervisor or the Program Administrator. The Program Administrator will evaluate the potential hazard, arranging for outside assistance as necessary. The Program Administrator will then communicate the results of that assessment back to the employees. If it is determined that respiratory protection is necessary, all other elements of this program will be in effect for those tasks and this program will be updated accordingly.



# ABM Technical Addendum

## Respiratory Protection Program



### *NIOSH Certification*

All respirators must be certified by the National Institute for Occupational Safety and Health (NIOSH) and shall be used in accordance with the terms of that certification. Also, all filters, cartridges, and canisters must be labeled with the appropriate NIOSH approval label. The label must not be removed or defaced while it is in use.

### *Voluntary Respirator Use*

ABM/[Insert Customer Name] will provide respirators at no charge to employees for voluntary use for the following work processes:

| <b>Table 3: Voluntary Respirator Use</b> |                   |                           |                 |
|--|-------------------|---------------------------|-----------------|
| <b>Department</b>                        | <b>Operations</b> | <b>Type of Respirator</b> | <b>Comments</b> |
|  |                   |                           |                 |
|  |                   |                           |                 |
|  |                   |                           |                 |
|  |                   |                           |                 |
|  |                   |                           |                 |
|  |                   |                           |                 |

The Program Administrator will provide to **any** employee who voluntarily chooses to wear respirators with a copy of the OSHA Standard 29CFR 1910.134.

Employees choosing to wear a respirator must comply with the procedures for Medical Evaluation, Respirator Use, and Cleaning, Maintenance and Storage.

The Program Administrator shall authorize voluntary use of respiratory protective equipment as requested by all other workers on a case-by-case basis, depending on specific workplace conditions and the results of the medical evaluations.

### **5. Medical Evaluation**

Employees who are either required to wear respirators, or who choose to wear a respirator voluntarily, must pass a medical exam before being permitted to wear a respirator on the job. Employees are not permitted to wear respirators until a licensed physician has determined that they are medically able to do so. Any employee refusing the medical evaluation will not be allowed to work in an area requiring respirator use.

# ABM Technical Addendum

## Respiratory Protection Program

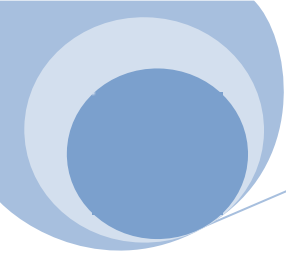


Medical evaluation procedures are as follows:

- The medical evaluation are intended to be convenient to the employees and will be conducted during normal working hours, using the questionnaire provided in Appendix C of the OSHA Respiratory Protection Standard. The Program Administrator will provide a copy of this questionnaire to all employees requiring medical evaluations.
- To the extent feasible, ABM/[Insert Customer Name] will assist employees who are unable to read the questionnaire (by providing help in reading the questionnaire). When this is not possible, the employee will be sent directly to the physician for medical evaluation.
- All affected employees will be given a copy of the medical questionnaire to fill out, along with a stamped and addressed envelope for mailing the questionnaire to the designated ABM/[Insert Customer Name] physician. Employees will be permitted to fill out the questionnaire on ABM/[Insert Customer Name] time.
- Follow-up medical exams will be granted to employees as required by the standard, and/or as deemed necessary by the physician.
- All employees will be granted the opportunity to speak with the physician about their medical evaluation, if they so request.
- The Program Administrator has provided ABM/[Insert Customer Name] physician with a copy of this program, a copy of the Respiratory Protection Standard, the list of hazardous substances by work area, and for each employee requiring evaluation; his or her work area or job title, proposed respirator type and weight, length of time required to wear the respirator, expected physical work load (light, moderate, or heavy), potential temperature and humidity extremes, and any additional protective clothing required.
- Any employee required for medical reasons to wear a positive pressure air-purifying respirator will be provided with a powered air-purifying respirator.
- After an employee has received clearance and begun to wear his or her respirator, additional medical evaluations will be provided under the following circumstances:
  - Employee reports signs and/or symptoms related to their ability to use a respirator, such as shortness of breath, dizziness, chest pains, or wheezing;
  - The ABM/[Insert Customer Name] physician or supervisor informs the Program Administrator that the employee needs to be reevaluated;
  - Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation;
  - A change occurs in the workplace conditions that may result in an increased physiological burden on the employee.

A list of employees currently included in medical surveillance is provided in Table 4 of this program.

All examinations and questionnaires will remain confidential between the employee and the physician.



## Respiratory Protection Program

### 6. Fit Testing

Fit testing is required for employees wearing respirators identified in Table 4. Employees voluntarily wearing respirators may also be fit tested upon request.

Employees who are required to wear respirators will be fit tested:

- Prior to being allowed to wear any respirator with a tight fitting facepiece.
- Annually.
- When there are changes in the employee’s physical condition that could affect respiratory fit (e.g., obvious change in body weight, facial scarring, etc.).

Employees will be fit tested with the make, model, and size of respirator that they will actually wear. Employees will be provided with several models and sizes of respirators so that they may find an optimal fit. Fit testing of Powered Air Purifying Respirators is to be conducted in the negative pressure mode.

The Program Administrator will conduct fit tests following the OSHA approved fit testing protocols in Appendix A and B of the Respiratory Protection Standard.

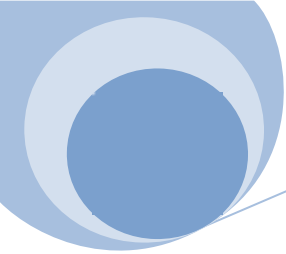
#### Respirator Use

Respiratory protection is required for the following personnel:

| Table 4: ABM/[Insert Customer Name] Employees in the Respiratory Protection Program |            |                |            |
|---|------------|----------------|------------|
| Name/Job Title  | Department | Work Procedure | Respirator |
|   |            |                |            |
|   |            |                |            |
|   |            |                |            |
|   |            |                |            |
|   |            |                |            |
|   |            |                |            |
|   |            |                |            |
|   |            |                |            |
|   |            |                |            |

#### General Use Procedures:

- Employees will use their respirators under conditions specified by this program, and in accordance with the training they receive on the use of each particular model. In addition, the respirator shall not be used in a manner for which it is not certified by NIOSH or by its manufacturer.



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- All employees shall conduct user seal checks each time that they wear their respirator. Employees shall use either the positive or negative pressure check (depending on which test works best for them) specified in Appendix B-1 of the OSHA Respiratory Protection Standard.
- All employees shall be permitted to leave the work area to maintain their respirator for the following reasons: to clean their respirator if the respirator is impeding their ability to work, change filters or cartridges, replace parts, or to inspect the respirator if it stops functioning as intended. Employees should notify their supervisor before leaving the area.
- Employees are not permitted to wear tight-fitting respirators if they have any condition, such as facial hair, glasses, or missing dentures that prevents them from achieving a good seal. Employees are not permitted to wear headphones, jewelry, or other articles that may interfere with the facepiece-to-face seal.

### Emergency Procedures – Use of Escape Respirators

The following work areas have been identified as having foreseeable emergencies:

| Table 5: Work Areas with Foreseeable Emergencies |                               |
|--|-------------------------------|
| Work Area/Operations                             | Type of Foreseeable Emergency |
|  |                               |
|  |                               |
|  |                               |
|  |                               |
|  |                               |
|  |                               |
|  |                               |

When an alarm sounds, employees in the work area must immediately put on their emergency escape respirator (or continue to wear their SCBA), shut down their process equipment, and exit the work area. All other employees in the building affected must immediately evacuate the building.

### *Respirator Malfunction*

#### 1. Air Purifying Respirator (APR) Malfunction:

For any malfunction of an APR (e.g., such as breakthrough, facepiece leakage, or improperly working valve), the respirator wearer should inform his or her supervisor that the respirator no longer functions as intended, and go to the designated safe area to maintain the respirator. The supervisor must ensure that the employee receives the needed parts to repair the respirator, or is provided with a new respirator.

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### 2. Atmosphere-supplying Respirator Malfunction:

If the work area is a permit confined space, all procedures outlined in the Permit Confined Space Program must be followed.

All workers wearing atmosphere-supplying respirators will work with a trained and properly equipped standby person outside of the area. Standby persons will maintain communication (visually and verbally) with the worker wearing the respirator. Standby persons shall assist workers who experience a respirator malfunction as follows:

- If a worker experiences a respirator failure, the worker shall use the auxiliary SCBA and immediately leave the area.
- If the worker cannot leave the area, the Standby person will use retrieval equipment to rescue the worker.
- If retrieval equipment was not provided, the Standby person must first notify a designated person of the emergency. Emergency personnel must respond before the Standby person enters the area to rescue the worker. If the Standby person assists in the rescue, an SCBA with an auxiliary SCBA shall be donned before entering the area to rescue the worker.

### 7. Air Quality

For supplied-air respirators, only Grade D breathing air shall be used in the cylinders. The Program Administrator will ensure that the cylinders received meets the specifications of Grade D breathing air.

The Program Administrator will ensure that there is a minimum air supply of one fully charged replacement cylinder for each SCBA unit. In addition, cylinders may be recharged as necessary by turning them over to the Fire Department.

### 8. Cleaning, Maintenance, Change Schedules and Storage

#### *Cleaning*

Respirators are to be regularly cleaned and disinfected at designated respirator cleaning stations within each department. Respirators issued for the exclusive use of an employee shall be cleaned as often as necessary.

Atmosphere supplying and emergency use respirators are to be cleaned and disinfected after each use.

The following procedure is to be used when cleaning and disinfecting respirators:

- Disassemble respirator, remove any filters, canister, or cartridges.
- Wash the facepiece and associated parts in a mild detergent with warm water. Do not use organic solvents.
- Rinse completely in clean warm water.
- Wipe the respirator with disinfectant wipes (70% Isopropyl Alcohol) to kill germs.
- Air-dry in a clean area.
- Reassemble the respirator and replace any defective parts.



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- Place in a clean, dry plastic bag or other airtight container.

The Program Administrator will coordinate with each department director to ensure that an adequate supply of appropriate cleaning and disinfection material exists in each department. If supplies are low, employees should contact their supervisor, who will inform their department director for replacement.

### *Maintenance*

Respirators are to be properly maintained at all times in order to ensure that they function properly and adequately to protect the employee. Maintenance involves a thorough visual inspection for cleanliness and defects. Worn or deteriorated parts will be replaced prior to use. No components will be replaced or repairs made beyond those recommended by the manufacturer. Repairs to regulators or alarms of atmosphere-supplying respirators will be conducted by the manufacturer.

The following checklist will be used when inspecting respirators:

- Facepiece:  
Cracks, tears, or holes  
Facemask distortion  
Cracked or loose lenses/faceshield
- Headstraps:  
Breaks or tears  
Broken buckles
- Valves:  
Residue or dirt  
Cracks or tears in valve material
- Filters/Cartridges:  
Approval designation  
Gaskets  
Cracks or dents in housing  
Proper cartridge for hazard
- Air Supply Systems:  
Breathing air quality/grade  
Condition of supply hoses  
Hose connections  
Settings on regulators and valves

Employees are permitted to leave their work area to perform limited maintenance on their respirator in a designated area that is free of respiratory hazards. Situations when this is permitted include washing their face and respirator facepiece to prevent any eye or skin irritation, replacing filter, cartridge or canister, and if they

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detect vapor or gas breakthrough or leakage in the facepiece or if they detect any other damage to the respirator or its components.

### *Change Schedules*

Employees wearing air purifying respirators or powered air purifying respirators for protection against dust or other particulates shall change the cartridge on their respirators when they first begin to experience difficulty breathing (i.e. resistance) while wearing their masks.

Based on discussions with our respirator distributor about the ABM/[Insert Customer Name]'s workplace exposure conditions, employees wearing air-purifying respirators with organic vapor cartridges shall change the cartridges on their respirators every \_\_\_\_\_ week(s) to ensure the continued effectiveness of the respirators.

### *Storage*

Respirators must be stored in a clean, dry area, and in accordance with the manufacturer's recommendations. Each employee will clean and inspect their own air-purifying respirator in accordance with the provisions of this program and will store their respirator in a plastic bag in their own locker. Each employee will have his/her name on the bag and that bag will only be used to store that employee's respirator.

Atmosphere supplying respirators will be stored in designated storage areas within each department.

### *Defective Respirators*

Respirators that are defective or have defective parts shall be taken out of service immediately. If, during an inspection, an employee discovers a defect in a respirator, he/she is to bring the defect to the attention of his or her supervisor. Supervisors will give all defective respirators to their department director. The department directors will decide whether to:

- Temporarily take the respirator out of service until it can be repaired.
- Perform a simple fix on the spot such as replacing a headstrap.
- Dispose of the respirator due to an irreparable problem or defect.

When a respirator is taken out of service for an extended period of time, the respirator will be tagged out of service, and the employee will be given a replacement of similar make, model, and size. All tagged out respirators will be kept in a separate storage cabinet within each department director's office.

## **9. Training**

The Program Administrator will arrange for training to be provided to respirator users and their supervisors on the contents of ABM and [Insert Customer Name]'s Respiratory Protection Program and their responsibilities under it, and on the OSHA Respiratory Protection Standard. Workers will be trained prior to using a respirator in the workplace. Supervisors will also be trained prior to using a respirator in the workplace or prior to supervising employees that must wear respirators.

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The training course will cover the following topics:

- ABM and [Insert Customer Name]’s Respiratory Protection Program
- The OSHA Respiratory Protection Standard
- Respiratory hazards encountered at the [Insert Customer Name] site and their health effects
- Proper selection and use of respirators
- Limitations of respirators
- Respirator donning and user seal (fit) checks
- Fit testing
- Emergency use procedures
- Maintenance and storage
- Medical signs and symptoms limiting the effective use of respirators

Employees will be retrained annually or as needed (e.g., if they change department and need to use a different respirator). Employees must demonstrate their understanding of the topics covered in the training through hands-on exercises and a written test. Respirator training will be documented by the Program Administrator and the documentation will include the type, model, and size of respirator for which each employee has been trained and fit tested.

### **10. Program Evaluation**

The Program Administrator will conduct periodic evaluations of the workplace to ensure that the provisions of this program are being implemented. The evaluations will include regular consultations with employees who use respirators and their supervisors, site inspections, air monitoring and a review of records.

Problems identified will be noted in an inspection log and addressed by the Program Administrator. These findings will be reported to each department director, and the report will list plans to correct deficiencies in the respirator program and target dates for the implementation of those corrections.

### **11. Documentation and Recordkeeping**

A written copy of this program and the OSHA Standard is kept in the Program Administrator’s office and is available to all employees who wish to review it.

Also maintained in the Program Administrator’s office are copies of training and fit test records. These records will be updated as new employees are trained, as existing employees receive refresher training, and as new fit tests are conducted.

The Program Administrator will also maintain copies of the medical records for all employees covered under the respirator program. The completed medical questionnaire and the physician’s documented findings are confidential and will remain at the physician’s office. ABM and [Insert Customer Name] will also retain the physician’s written recommendation regarding each employee’s ability to wear a respirator.

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## Respiratory Protection Program



### Appendix A – Annual Fit Testing Procedures -- General Requirements (Mandatory)

#### Part I. OSHA-Accepted Fit Test Protocols

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.
2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.
3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.
4. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.
5. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.
6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:
  - (a) Position of the mask on the nose
  - (b) Room for eye protection
  - (c) Room to talk
  - (d) Position of mask on face and cheeks
7. The following criteria shall be used to help determine the adequacy of the respirator fit:
  - (a) Chin properly placed;
  - (b) Adequate strap tension, not overly tightened;



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- (c) Fit across nose bridge;
- (d) Respirator of proper size to span distance from nose to chin;
- (e) Tendency of respirator to slip;
- (f) Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 of this section or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B-1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.

11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

12. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

14. Test Exercises. (a) The following test exercises are to be performed for all fit testing methods prescribed in this appendix, except for the CNP method. A separate fit testing exercise regimen is contained in the CNP protocol. The test subject shall perform exercises, in the test environment, in the following manner:

- (1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.
- (2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
- (3) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.



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(4) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

### **Rainbow Passage**

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(6) Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)

(7) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

(8) Normal breathing. Same as exercise (1).

(b) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.



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### Appendix B - Fit Test Protocols

#### Qualitative Fit Test Protocols

1. General – ABM is not qualified to perform the proper fit testing for respirator use. ABM will insure that the provider of this service is certified and compliant in and with all regulations as outlined in OSHA Standards 29 CFR 1910.134. This testing will be done annually.

(a) ABM shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

(b) ABM shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

#### Quantitative Fit Test (QNFT) Protocols

1. General - ABM is not qualified to perform the proper quantitative fit testing for respirator use. ABM will insure that the provider of this service is certified and compliant in and with all regulations as outlined in OSHA Standards 29 CFR 1910.134. This testing will be done annually.

(a) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.

(b) The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.



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### Appendix B-1: User Seal Check Procedures (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved **each time** the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturers recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

#### I. Facepiece Positive and/or Negative Pressure Checks

A. Positive pressure check. Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. Negative pressure check. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

#### II. Manufacturer's Recommended User Seal Check Procedures

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.



### Appendix B-2: Respirator Cleaning Procedures (Mandatory)

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

#### I. Procedures for Cleaning Respirators

A. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

B. Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

C. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.

D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

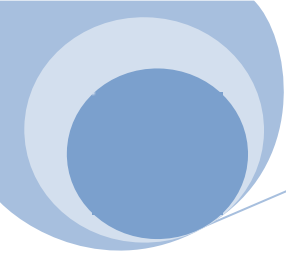
1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,
2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,
3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

F. Components should be hand-dried with a clean lint-free cloth or air-dried.

G. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

H. Test the respirator to ensure that all components work properly.



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### Appendix C: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

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

**To the employee:**

Can you read (circle one): Yes/No

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

Part A. Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: \_\_\_\_\_

2. Your name: \_\_\_\_\_

3. Your age (to nearest year): \_\_\_\_\_

4. Sex (circle one): Male/Female

5. Your height: \_\_\_\_\_ ft. \_\_\_\_\_ in.

6. Your weight: \_\_\_\_\_ lbs.

7. Your job title: \_\_\_\_\_

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): \_\_\_\_\_

9. The best time to phone you at this number: \_\_\_\_\_

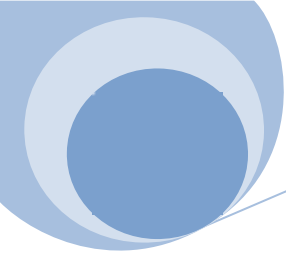
10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

11. Check the type of respirator you will use (you can check more than one category):

a. \_\_\_\_\_ N, R, or P disposable respirator (filter-mask, non-cartridge type only).

b. \_\_\_\_\_ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): Yes/No



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If "yes," what type(s): \_\_\_\_\_  
\_\_\_\_\_

Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month:  
Yes/No

2. Have you ever had any of the following conditions?

- a. Seizures (fits): Yes/No
- b. Diabetes (sugar disease): Yes/No
- c. Allergic reactions that interfere with your breathing: Yes/No
- d. Claustrophobia (fear of closed-in places): Yes/No
- e. Trouble smelling odors: Yes/No

3. Have you ever had any of the following pulmonary or lung problems?

- a. Asbestosis: Yes/No
- b. Asthma: Yes/No
- c. Chronic bronchitis: Yes/No
- d. Emphysema: Yes/No
- e. Pneumonia: Yes/No
- f. Tuberculosis: Yes/No
- g. Silicosis: Yes/No
- h. Pneumothorax (collapsed lung): Yes/No
- i. Lung cancer: Yes/No
- j. Broken ribs: Yes/No
- k. Any chest injuries or surgeries: Yes/No
- l. Any other lung problem that you've been told about: Yes/No

4. Do you currently have any of the following symptoms of pulmonary or lung illness?

- a. Shortness of breath: Yes/No
- b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No
- c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No
- d. Have to stop for breath when walking at your own pace on level ground: Yes/No
- e. Shortness of breath when washing or dressing yourself: Yes/No
- f. Shortness of breath that interferes with your job: Yes/No
- g. Coughing that produces phlegm (thick sputum): Yes/No
- h. Coughing that wakes you early in the morning: Yes/No
- i. Coughing that occurs mostly when you are lying down: Yes/No
- j. Coughing up blood in the last month: Yes/No
- k. Wheezing: Yes/No
- l. Wheezing that interferes with your job: Yes/No
- m. Chest pain when you breathe deeply: Yes/No
- n. Any other symptoms that you think may be related to lung problems: Yes/No

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5. Have you ever had any of the following cardiovascular or heart problems?

- a. Heart attack: Yes/No
- b. Stroke: Yes/No
- c. Angina: Yes/No
- d. Heart failure: Yes/No
- e. Swelling in your legs or feet (not caused by walking): Yes/No
- f. Heart arrhythmia (heart beating irregularly): Yes/No
- g. High blood pressure: Yes/No
- h. Any other heart problem that you've been told about: Yes/No

6. Have you ever had any of the following cardiovascular or heart symptoms?

- a. Frequent pain or tightness in your chest: Yes/No
- b. Pain or tightness in your chest during physical activity: Yes/No
- c. Pain or tightness in your chest that interferes with your job: Yes/No
- d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
- e. Heartburn or indigestion that is not related to eating: Yes/ No
- f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No

7. Do you currently take medication for any of the following problems?

- a. Breathing or lung problems: Yes/No
- b. Heart trouble: Yes/No
- c. Blood pressure: Yes/No
- d. Seizures (fits): Yes/No

8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)

- a. Eye irritation: Yes/No
- b. Skin allergies or rashes: Yes/No
- c. Anxiety: Yes/No
- d. General weakness or fatigue: Yes/No
- e. Any other problem that interferes with your use of a respirator: Yes/No

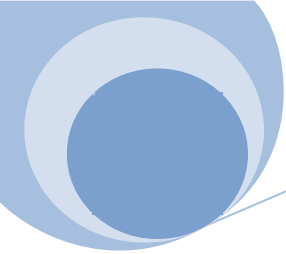
9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA).

For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you ever lost vision in either eye (temporarily or permanently): Yes/No

11. Do you currently have any of the following vision problems?



# ABM Technical Addendum

## Respiratory Protection Program



- a. Wear contact lenses: Yes/No
- b. Wear glasses: Yes/No
- c. Color blind: Yes/No
- e. Any other eye or vision problem: Yes/No

12. Have you ever had an injury to your ears, including a broken ear drum: Yes/No

13. Do you currently have any of the following hearing problems?

- a. Difficulty hearing: Yes/No
- b. Wear a hearing aid: Yes/No
- c. Any other hearing or ear problem: Yes/No

14. Have you ever had a back injury: Yes/No

15. Do you currently have any of the following musculoskeletal problems?

- a. Weakness in any of your arms, hands, legs, or feet: Yes/No
- b. Back pain: Yes/No
- c. Difficulty fully moving your arms and legs: Yes/No
- d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
- e. Difficulty fully moving your head up or down: Yes/No
- f. Difficulty fully moving your head side to side: Yes/No
- g. Difficulty bending at your knees: Yes/No
- h. Difficulty squatting to the ground: Yes/No
- i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No
- j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

Part B Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes/No

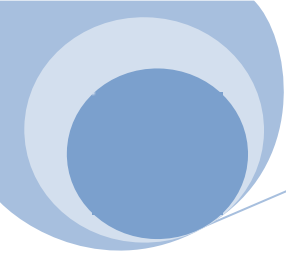
If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes/No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes/No

If "yes," name the chemicals if you know them: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

- a. Asbestos: Yes/No
- b. Silica (e.g., in sandblasting): Yes/No
- c. Tungsten/cobalt (e.g., grinding or welding this material): Yes/No
- d. Beryllium: Yes/No



# ABM Technical Addendum

## Respiratory Protection Program



- e. Aluminum: Yes/No
  - f. Coal (for example, mining): Yes/No
  - g. Iron: Yes/No
  - h. Tin: Yes/No
  - i. Dusty environments: Yes/No
  - j. Any other hazardous exposures: Yes/No
- If "yes," describe these exposures: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. List any second jobs or side businesses you have: \_\_\_\_\_

\_\_\_\_\_

5. List your previous occupations: \_\_\_\_\_

\_\_\_\_\_

6. List your current and previous hobbies: \_\_\_\_\_

\_\_\_\_\_

7. Have you been in the military services? Yes/No  
 If "yes," were you exposed to biological or chemical agents (either in training or combat):  
 Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes/No

If "yes," name the medications if you know them: \_\_\_\_\_

10. Will you be using any of the following items with your respirator(s)?

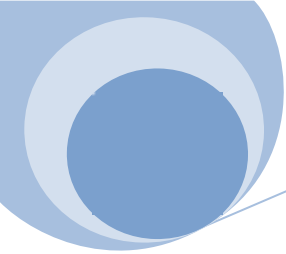
- a. HEPA Filters: Yes/No
- b. Canisters (for example, gas masks): Yes/No
- c. Cartridges: Yes/No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

- a. Escape only (no rescue): Yes/No
- b. Emergency rescue only: Yes/No
- c. Less than 5 hours per week: Yes/No
- d. Less than 2 hours per day: Yes/No
- e. 2 to 4 hours per day: Yes/No
- f. Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your work effort:

- a. Light (less than 200 kcal per hour): Yes/No



# ABM Technical Addendum

## Respiratory Protection Program



If "yes," how long does this period last during the average shift: \_\_\_\_\_ hrs. \_\_\_\_\_ mins.

Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.

b. Moderate (200 to 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: \_\_\_\_\_ hrs. \_\_\_\_\_ mins.

Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. Heavy (above 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: \_\_\_\_\_ hrs. \_\_\_\_\_ mins.

Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes/No

If "yes," describe this protective clothing and/or equipment: \_\_\_\_\_

\_\_\_\_\_

14. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes/No

15. Will you be working under humid conditions: Yes/No

16. Describe the work you'll be doing while you're using your respirator(s):

\_\_\_\_\_  
\_\_\_\_\_

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

\_\_\_\_\_  
\_\_\_\_\_

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s): Name of the first toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

Name of the second toxic substance: \_\_\_\_\_

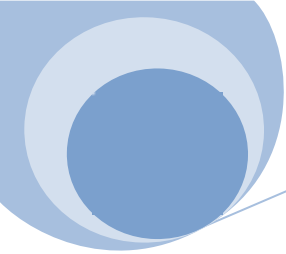
Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

Name of the third toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_



# ABM Technical Addendum

## Respiratory Protection Program



The name of any other toxic substances that you'll be exposed to while using your respirator:

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19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security):

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# ABM Technical Addendum

## Respiratory Protection Program



### Appendix D: Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

# ABM Technical Addendum

## Asbestos Program



### **1. Policy**

It is the policy of ABM that personnel shall not be involved in repairs, maintenance or removal of asbestos containing materials (ACM). As such, all repairs or removal of ACM shall be contracted to authorized contractors who have been properly trained and certified.

In addition, ABM equires that clients, whose property contains ACM and/or PACM, provide ABM with access to the site O&M plan, including an inventory of ACM and PACM, so that its location and type can be communicated to employees.

### **11. Purpose**

The purpose of this program is to establish the guidelines for management of asbestos containing materials to make ABM employees, contractors, visitors and vendors aware of how to recognize and avoid asbestos containing materials as well as the potential health hazards of asbestos related exposures, in order to minimize or eliminate the potential for exposure.

### **12. Scope**

This program applies to all employees conducting business and/or providing contracted services in buildings and structures managed and/or operated by or on behalf of ABM which contain known or presumed asbestos containing materials.

### **13. Responsibilities**

#### **Manager or Chief Engineer**

- Ensure that the project/contract requires the client to identify, label or otherwise conspicuously make known all asbestos containing material.
- Obtain O&M plan and ACM/PACM inventory from client.
- Communicate location and type of ACM/PACM to all applicable employees.
- Ensure contractors performing work that could potentially disturb ACM, or contractors involved in repair, maintenance or removal of ACM, are qualified – trained and/or licensed – as required by EPA and OSHA.

#### **Supervisors**

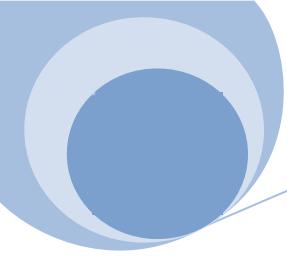
- Notify the client or other appropriate building owner immediately upon discovering damaged or disturbed asbestos containing materials.
- Ensure employees are appropriately trained to work in a facility with ACM.
- Ensure employees avoid work that involves the repair, maintenance or removal of ACM.

#### **Employees**

- Complete required asbestos-related training.
- Keep away from and report any damaged asbestos containing material to supervisor.

### **14. Definitions**

**Asbestos:** Asbestos is a generic term describing a family of naturally occurring fibrous silicate minerals. Although there are several other varieties that have been used commercially, the most common asbestos mineral types likely to be encountered in buildings are chrysotile (white asbestos), amosite (brown asbestos), and crocidolite (blue asbestos), tremolite, anthophyllite, actinolite, and any of these minerals that have been chemically treated and/or altered. Among these, white asbestos is by far the most common asbestos mineral present in commercial



# ABM Technical Addendum

## Asbestos Program



buildings built between 1940 and 1979. As a group, the minerals are noncombustible, do not conduct heat or electricity and are resistant to many chemicals.

**Asbestos Containing Material (ACM) (OSHA):** Asbestos containing material means any material which contains more than 1 percent asbestos by weight.

**Asbestos Containing Material (ACM) (EPA):** The EPA asbestos NESHAP standard categorizes asbestos-containing material according to its friability. Materials greater than one percent asbestos are Regulated Asbestos-Containing Materials (RACM) if they are friable asbestos material; category I non-friable ACM that has become friable; category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or, category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

**Authorized person:** Any person authorized by the employer and required by work duties to be present in regulated areas.

**Excursion limit:** The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty (30) minutes.

**Friable Asbestos:** Friable means that the material can be crumbled, pulverized, or reduced to finely divided particles, fibers or powder by hand pressure. Three types of friable material commonly used in buildings are:

- sprayed fibrous fireproofing;
- decorative or acoustic texture coatings;
- thermal insulation.

**Non-Friable Asbestos:** Non-friable asbestos includes a range of products in which asbestos fiber is effectively bound in a solid matrix from which asbestos fiber cannot normally escape. Non-friable asbestos includes a variety of products including asbestos cement tiles and boards and asbestos reinforced vinyl floor tiles. Cutting, braking, sanding, drilling of similar activities can release asbestos fiber from even non-friable asbestos materials.

**Operations & Maintenance (O&M) Plan:** Specific procedures and practices developed for the interim control of ACM in buildings until it is removed. The facility O&M plan is maintained and provided by the client and/or building owner.

**Permissible Exposure Limit (PEL):** The highest allowable level of exposure to airborne asbestos fibers that an employee may have, without using respiratory protection, as stated by OSHA.

**Presumed Asbestos Containing Material (PACM):** Thermal system insulation and surfacing material found in buildings constructed no later than 1980. All materials meeting this definition must be presumed to be asbestos containing and handled as such unless analytical testing proves otherwise.

**Surfacing Material:** Examples include ACM applied (sprayed or troweled) onto surfaces, such as decorative plaster on ceilings or acoustical ACM on the underside of concrete slabs or decking, or fireproofing materials on structural members.

## Asbestos Program

### 15. Program Requirements

#### 6.1 Asbestos Overview

Asbestos is a generic term describing a family of naturally occurring fibrous silicate minerals. Asbestos has desirable characteristics; the minerals are noncombustible, do not conduct heat or electricity and are resistant to many chemicals. Because of these characteristics, asbestos containing materials were widely used as building, construction and insulating materials in buildings from the 1940's through the late 1970's. Generally, most asbestos is found in pipe insulation, doors, textured paints and plasters, structural fireproofing, and floor tiles.

In addition, OSHA requires building owners to presume that thermal system insulation (TSI) and surfacing ACM found in buildings constructed before 1980 are asbestos containing, unless demonstrated to be one percent or less asbestos through sampling. The rule does not permit the assumption that materials used in buildings constructed after 1980 are asbestos-free.

Usually asbestos is mixed with other materials to form products. Depending on what the product is, the amount of asbestos in asbestos-containing materials (ACM) may vary from 1%-100%. Examples of products that might contain asbestos are:

- Sprayed on fire proofing and insulation in buildings
- Insulation for pipes and boilers
- Wall and ceiling insulation
- Floor tiles
- Putties, caulks, and cements (such as in chemical carrying cement pipes)
- Wall and ceiling texture in older buildings and homes
- Joint compound in older buildings and homes
- Cooling tower panels

#### 6.2 Recognizing Asbestos Containing Materials

Information regarding the presence and location of asbestos can be found within existing documentation such as a facility O&M plan, which contains information such as an asbestos inventory, previous surveys and analyses from current facility owners or their representatives. Documentation typically provides information regarding:

- a) Location of the material;
  - b) Type of asbestos-containing material (i.e. sprayed fireproofing, texture coating, or thermal insulation);
  - c) Percentage of asbestos present; and
  - d) Date: When it was sampled.
- e) Also included in the survey information may be sampling results showing the absence of asbestos in material.

Asbestos signage is used to alert people to the presence of asbestos. Asbestos is labeled by tags, stickers, pipe labels, signs and other high visibility means. Where feasible, stickers indicate the presence of asbestos in thermal insulation, in asbestos board and tiles and in other locations. Warnings may also be placed near the entrances of rooms, particularly mechanical rooms where unusually large amounts of asbestos may be present. Asbestos labeling must comply with the requirements of 29 CFR 1910.1001(j)(3) of OSHA's Asbestos standard, and include the following information:

**DANGER**

**CONTAINS ASBESTOS FIBERS**

# ABM Technical Addendum

## Asbestos Program



### AVOID CREATING DUST

### CANCER AND LUNG DISEASE HAZARD

#### 6.3 Management of Asbestos Containing Materials

Effective management of ACM depends on the nature of the material, its condition, nature of work or type of disturbance of ACM and the resulting potential for exposure. Asbestos containing materials that are in a safe, intact condition and do not present a hazard to personnel may be left in place. While asbestos is a serious health and safety concern, available data and risk assessments indicate that properly managed, undamaged asbestos containing materials do not present a significant health risk to building occupants.

All ABM employees, visitors, vendors and contractors will be notified in advance when work involving asbestos is to be carried out. Access to mechanical and electrical rooms, service shafts, tunnels and other locations is to be restricted until the existence of asbestos is either confirmed or denied and its condition is assessed. Such areas are to be locked and accessible only to authorized personnel. Regulated areas with asbestos containing materials will be distinguished from the rest of the workplace in any manner that minimizes the number of persons who will be exposed to asbestos.

ABM employees and contractors working in areas that contain ACM must perform the work in a manner that will prevent the disturbance of ACM. If it is not possible to complete the work without disturbing the ACM, the work must cease until a licensed asbestos abatement contractor can remove the ACM.

Should an ABM employee or a contractor encounter material which is not identified and is not listed in the asbestos inventory but which might reasonably be expected to be asbestos, the person will stop any work which could create airborne asbestos and report the discovery to a supervisor. If anyone discovers or accidentally damages materials suspected of containing asbestos, they must:

- Leave the area immediately and report the situation to their supervisor.
- Post signs and control access to the area.
- The supervisor must report the damage to the client representative and facility safety personnel.

The facility O&M program, which is provided by the client, should include a system to control all work that could disturb ACM. An asbestos work permit program is required for contractors (non-ABM personnel) prior to performing work that could disturb ACM. The appropriate asbestos work permit form should be obtained from the client. Appendix A provides an example of an asbestos work permit, which requires that the contractor provide information such as the time and location of the requested work, the type of maintenance needed, and available information about any ACM in the vicinity of the requested work. The contractor or other person authorized to perform the work must be identified on the work request.

**Only qualified non-ABM personnel shall be involved in repairs, maintenance or removal of asbestos containing materials (ACM). As such, all repairs or removal of ACM shall be contracted to authorized contractors who have been properly trained and certified.**

In the case of Multi-employer worksites, ABM employees will be removed from site during any ACM removal or work including ACM by others and not be allowed to return until testing has proven a safe atmosphere exists.

## Asbestos Program

### 6.4 Asbestos Exposure Potential and Health Effects

The most common way for asbestos fibers to enter the body is through breathing. In fact, ACM is not generally considered to be harmful unless it is releasing fibers into the air where they can be inhaled or ingested. Airborne fibers can become trapped in the mucous membranes of the nose and throat where they can then be removed but, some may pass deep into the lungs, or, if swallowed, into the digestive tract.

Because it is so hard to destroy asbestos fibers, the body cannot break them down or remove them once they are lodged in the lungs or body tissues. They remain in place where they can cause disease. Once they are trapped in the body, the fibers can cause health problems. Long term exposure to airborne asbestos can lead to a variety of respiratory diseases. There are three primary diseases associated with asbestos exposure: asbestosis, lung cancer, and mesothelioma.

To avoid being exposed to asbestos, you must be aware of the locations it is likely to be found. If you do not know whether something is asbestos or not, assume that it is until it is verified otherwise. Remember that you cannot tell if floor tile or insulation contains asbestos just by looking at them. If you have reason to suspect that something is asbestos, either because it is labeled as such, or because it is something that is likely to contain asbestos (9 inch floor tile, for example), DO NOT DISTURB IT.

Never do the following to any asbestos containing materials or suspected materials:

- Drill
- Hammer
- Cut
- Saw
- Break
- Damage
- Move
- Disturb

### 6.5 Exposure Monitoring

Initial exposure monitoring is conducted for those who are, or may reasonably be expected to be, exposed to airborne concentrations at or above the permissible exposure limit and/or excursion limit. If there is objective data which demonstrates that asbestos is not capable of being released in airborne concentrations at or above the permissible exposure limit and/or excursion limit under the expected conditions of processing, use, or handling, then no initial monitoring is required.

Within 15 working days after the receipt of the results of any exposure monitoring performed, each affected employee will be notified of these results either individually in writing or by posting the results in an appropriate location that is accessible to affected employees. The written notification must contain the corrective action being taken by the employer to reduce employee exposure to or below the permissible exposure limit and/or excursion limit, wherever monitoring results indicated that the permissible exposure limit and/or excursion limit had been exceeded.

### 16. Training

All employees working in facility containing ACM or PACM must receive a minimum of annual asbestos awareness training, to include:

- Types, properties and uses of asbestos
- Ways to recognize asbestos
- Health hazards of asbestos fiber inhalation
- Types of activities which could release asbestos fibers



# ABM Technical Addendum

## Asbestos Program



- Location of ACM and PACM within the building or work areas

### **17. Recordkeeping Requirements**

- Employee training records.
- Employee exposure records.
- All records related to asbestos inventory, repair/abatement work, sample analysis, etc. are maintained within the client's O&M plan.

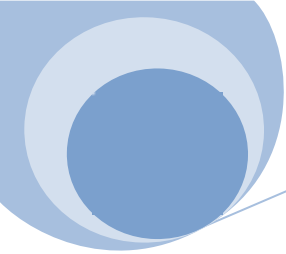
### **18. References**

Federal OSHA [29 CFR 1910.1001](#)

CAL-OSHA [CCR T8 5208](#)

### **19. Attachments**

Sample Asbestos Work Permit



# ABM Technical Addendum Asbestos Program



## Sample Asbestos Work Permit

Form to be completed and submitted to maintenance work approval.

### Job Request Form for Maintenance Work

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Telephone No. \_\_\_\_\_ Job Request No. \_\_\_\_\_

Requested starting date: \_\_\_\_\_ Anticipated finish date: \_\_\_\_\_

Address, building, and room number (or description of job) where work is to be performed:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Description of work:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Method of asbestos testing and/or removal (if known) (include location and type):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Site and building name and address:

\_\_\_\_\_

Client name and address:

\_\_\_\_\_

Client title:

\_\_\_\_\_

Client contact person:

NOTE: This request is valid for 30 days from the date of approval. If the work is not completed within this period, a new request must be submitted.

\_\_\_\_\_  
Requested By: \_\_\_\_\_  
\_\_\_\_\_  
Approved By: \_\_\_\_\_

\_\_\_\_\_  
Date: \_\_\_\_\_



# ABM Technical Addendum

## Bloodborne Pathogens Program



### 1. Purpose

This purpose of this program is to establish policy and procedures for managing occupational exposure to blood or other potentially infectious materials as defined in 29 CFR 1910.1030, OSHA's Bloodborne Pathogen Standard.

### 2. Scope

This program applies to all ABM sites and projects and employees who, as a result of doing their job, may come into contact with blood or other potentially infectious materials. Routes of entry may occur from exposure to the eyes, nose, mouth and/or skin including means of puncture wounds from sharp objects such as blades, metal shavings, a needle stick and/or laceration.

Job classifications, which have potential to become exposed to bloodborne pathogens and/or infectious materials, are:

- A. Designated first-aid and/or emergency responders
- B. Custodian, janitorial and/or housekeeping personnel.
- C. Employees responsible for performing plumbing tasks

Note: See Job Exposure Determination Inventory for your facility.

### 3. Definitions

**Blood:** Human blood, human blood components and products made from human blood.

**Bloodborne Pathogens:** Pathogenic organisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), and human immunodeficiency virus (HIV).

**Clinical Laboratory:** Workplace where diagnostic or other screening procedures is performed on blood or other potentially infectious materials.

**Contaminated:** The presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

**Contaminated Laundry:** Laundry that has been soiled with blood or other potentially infectious materials or may contain sharps.

**Contaminated Sharps:** Any contaminated object that can penetrate the skin including, but not limited to needles, scalpels, and broken glass, capillary tubes and ends of dental wires.

# ABM Technical Addendum

## Bloodborne Pathogens Program



**Decontamination:** The use of physical or chemical means to remove, inactivate or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use or disposal.

**Engineering Controls:** Controls (e.g., sharps disposal containers, self-sheathing needles) that isolate or remove the bloodborne pathogens hazard from the workplace.

**Exposure Incident:** A specific eye, mouth other mucous membrane, non-intact skin or parenteral contact with blood or other potentially infectious materials that result's from the performance of an employee's duties.

**Hand Washing Facilities:** A facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.

**Hepatitis B Virus (HBV):** A potentially life threatening bloodborne pathogen. Infections are transmitted through exposure to blood and infected bodily fluids. A vaccine can prevent the virus. There are several forms of Hepatitis.

**Human Immunodeficiency Virus (HIV):** Attacks' the body's immune system. The immune system is weakened to the point of allowing infections to prevail over the bodies natural defenses.

**Occupational Exposure:** Reasonably anticipated skin, eye, mucous membrane, or parenteral contact, with blood or other potentially infectious materials that may result from the performance or an employee's duties.

**Other Potentially Infectious Materials (OPIM):** (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood and all body fluids in situations where it is difficult or impossible to differentiate between body fluids; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and (3) HIV-containing cell or tissue cultures and HIV or HBV containing culture medium or other solutions; and blood, organs or other tissues from experimental animals infected with HIV or HBV.

**Parental:** Piercing mucous membranes or the skin barrier through such events as needle sticks, human bites, cuts and abrasions.

**Personal Protective Equipment (PPE):** Specialized clothing or equipment worn by an employee for protection against a hazard. Note: General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protections against a hazard are not considered to be personal protective equipment.

**Regulated Waste:** Liquid or semi-liquid blood or other potentially infectious materials, contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

# ABM Technical Addendum

## Bloodborne Pathogens Program



**Source Individual:** Any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee. Examples include, but are not limited to, hospital and clinic patients; clients in institutions for the developmentally disabled; trauma victims; clients of drug and alcohol treatment facilities; residents of hospices and nursing homes; human remains; and individuals who donate or sell blood or blood components.

**Sterilize:** The use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

**Universal Precautions:** An approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV and other bloodborne pathogens.

**Work Practice Controls:** Controls that reduce the likelihood of exposures by altering the manner in which a task is performed.

#### 4. Responsibility

##### Facility Manager

- Ensures that all managers and/or supervisors/lead personnel and employees have received training necessary to manage their responsibilities as required by this program.
- Ensures resources are available for methods of compliance and implementation of this program.
- Ensures Facility's compliance with the Company's Bloodborne Exposure and Control Plan.

##### Supervisor/Lead

Provides direction and administration of the Facility's Bloodborne Exposure and Control Plan. Elements of the Facility's Bloodborne Exposure and Control Plan include:

- Elimination or reduction of occupational exposures to bloodborne pathogens.
- Institute work practices that minimize employee bloodborne pathogen exposure.
- Performance of a Job Exposure Determination Inventory.
- Establish a schedule and methodology for program implementation. This includes:
  - Methods of Compliance
  - List of HIV and HBV Research Laboratories and Production Facilities
  - Hepatitis B Vaccination and Post Exposure Evaluation & Follow-up
  - Communication of hazards to employees
  - Recordkeeping requirements
- Evaluating circumstances surrounding exposure incidents and ensuring the corrective action(s) is completed to prevent reoccurrence of the incident.
- Ensure that a copy of the Exposure Control Plan is accessible to employees upon request.

# ABM Technical Addendum

## Bloodborne Pathogens Program



- As a minimum, annually review and update and whenever necessary to reflect new or modified tasks and procedures which affect occupational exposure and to reflect new or revised employee positions with occupational exposure.
- Ensures that all employees under their supervision are trained in this Program.

### Employees

- Performs their work according to established safe work practices and procedures.
- Participates in scheduled training sessions.
- Understands the exposures within their job responsibilities associated with this Program.

## 5. General Requirements

**Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials.**

### Engineering and work practice controls

- Engineering and work practice controls shall be used to eliminate or minimize employee exposure. Where occupational exposure remains after institution of engineering controls, personal protective equipment shall also be used.
- Engineering controls shall be evaluated and maintained and/or replaced on a regular schedule to ensure their effectiveness.
- Hand-washing facilities will be accessible to employees.
- If hand-washing facilities are not feasible, either antiseptic hand cleaners or towelettes will be provided. When antiseptic hand cleaners or towelettes are used, hands shall be washed with soap and running water as soon as feasible.
- Employees will wash their hands immediately or as soon as feasible after removal of gloves or other personal protective equipment.
- Employees will wash hands and any other exposed skin with soap and water or flush mucous membranes with water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials.
- Contaminated needles and other contaminated sharps shall not be bent, recapped or removed except as listed below: **Note: Shearing or breaking of contaminated needles is prohibited.**
- Contaminated needles and other contaminated sharps shall not be bent, recapped or removed except unless no alternative is feasible or that such action is required by a specific medical procedure.
- Such bending, recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.
- Immediately or as soon as possible after use, contaminated reusable sharps shall be placed in appropriate containers until properly reprocessed. These containers shall be:
  - Puncture resistant;

# ABM Technical Addendum

## Bloodborne Pathogens Program



- Labeled or color-coded in accordance with the Bloodborne Pathogen Standard
- Leak-proof on the sides and bottom; and
- Contaminated reusable sharps shall not be stored or processed in a manner that requires employees to reach by hand into the containers where these sharps have been placed.
- Eating, drinking, smoking applying cosmetics or lip balm and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure.
- Food and drink shall not be kept in refrigerators, freezers, shelves and cabinets or on countertops or bench tops where blood or other potentially infectious materials are present.
- All procedures involving blood or OPIM shall be performed in such a manner as to minimize splashing, spattering and generation of droplets of these substances.
- Specimens of blood or OPIM shall be placed in a container that prevents leakage during collection, handling, processing, storage, transport or shipping.
- Storage, transport or shipping containers shall be labeled or color-coded in accordance to our labeling requirements.
- If contamination of the primary container occurs, the primary container shall be placed within a second container which prevents leakage during handling, processing, storage, transport or shipping and is labeled or color-coded in accordance with this standard.
- If the specimen could puncture the primary container, the primary container shall be placed within a secondary container that is puncture-resistant in addition to the above characteristics.
- Contaminated equipment shall be examined prior to servicing or shipping and shall be decontaminated as necessary, unless decontamination of such equipment or portions of such equipment is not feasible.
  - A. A readily observable label shall be attached to the equipment and state which portions of the equipment remain contaminated.
  - B. Information will be conveyed to all affected employees, the servicing representative and/or manufacturer as appropriate, prior to handling, servicing or shipping so that appropriate precautions will be taken.

### **Personal protective equipment.**

- Provide, at not cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shield or masks and eye protection and mouthpieces, resuscitation bags, pocket masks or ventilation devices.
- Personal protective equipment will be considered “appropriate” only if it does not permit blood or OPIM to pass through or reach the employee’s work clothes or street clothes, undergarments, skin, eyes, mouth or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.
- Employees will use appropriate personal protective equipment unless the employee temporarily and briefly declined to use personal protective equipment when, under rare and extraordinary circumstances,

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## Bloodborne Pathogens Program



it was the employee's professional judgment that in the specific instance its use would have posed an increased hazard to the safety of the worker and/or co-worker.

- When the employee makes this judgment, the circumstances shall be investigated and documented in order to determine whether changes can be instituted to prevent occurrences in the future.
- Appropriate PPE in the appropriate sizes will be readily accessible at the work site or is issued to employees. Hypoallergenic gloves, glove liners, powder-less gloves, or other similar alternatives shall be readily accessible to those employees who are allergic to the gloves normally provided.
- PPE will be cleaned, laundered and disposed of at no cost to the employee.
- PPE will be repaired and replaced as needed to maintain its effectiveness, at no cost to the employee.
- Contaminated garment(s) shall be removed immediately or as soon as feasible.
- All PPE shall be removed prior to leaving the work area.
- Upon removal, PPE shall be placed in an appropriately designated area or container for storage, washing, decontamination or disposal.
- Gloves shall be worn when handling or touching contaminated items or surfaces.
- Disposable (single use) gloves shall be replaced if they are torn, punctured or when their ability to function as a barrier is compromised.
- Disposable (single use) gloves will be disposed after each use.
- Masks in combination with goggles, glasses or face shields shall be worn whenever splashes, spray, spatter or droplets of blood or OPIM may be generated and eye, nose or mouth contamination can be reasonably anticipated.
- Gowns, aprons, lab coats, clinic jackets or similar outer garments shall be worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated.
- Surgical caps or hoods and/or shoe covers or boots shall be worn in instances when gross contamination can reasonably be anticipated.

### Housekeeping.

The work site will be maintained in a clean and sanitary condition. A written schedule for cleaning and method of decontamination based upon the facility location, type of surface to be cleaned, type of soil present and tasks or procedures being performed in the area.

- All equipment and environmental working surfaces shall be cleaned and decontaminated after contact with blood or OPIM.
- Contaminated work surfaces shall be decontaminated with an appropriate disinfectant after completion of procedures, immediately or as soon as possible when surfaces are overtly contaminated, or after any spill of blood or OPIM; and at the end of the work shift if the surface may have become contaminated since the last cleaning.
- Protective coverings, such as plastic wrap, aluminum foil or imperviously-backed absorbent paper used to cover equipment and environmental surfaces, shall be removed and replaced as soon as feasible when

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## Bloodborne Pathogens Program



they become overtly contaminated or at the end of the work shift if they may have become contaminated during the shift.

- All bins, pails, cans and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or OPIM shall be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.
- Contaminated broken glassware shall not be picked up directly with the hands; use mechanical means, such as a brush and dustpan, tongs or forceps.
- Contaminated reusable sharps shall not be stored or processed in a manner that requires employees to reach by hand into the containers where these sharps have been placed.

### **Regulated Waste.**

Contaminated sharps shall be discarded immediately in containers that are:

- Closable;
- Puncture resistant;
- Leak proof on sides and bottom; and
- Labeled or color coded in accordance with labeling requirements of this Program;
- During use, containers for contaminated sharps shall be:
  - Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used or can be reasonably anticipated to be found;
  - Maintained upright throughout use; and
  - Replaced routinely and not be allowed to overfill.
- When transporting contaminated sharps' containers from the area of use, the containers shall be:
  - Closed immediately prior to removal or replacement to prevent spillage or protrusion of contents;
  - Placed in a secondary container if leakage is possible. The second container shall be:
    - Closable;
    - Constructed to contain all contents and prevent leakage during handling, storage, transport or shipping; and
    - Labeled or color-coded according to labeling requirements of this Program.
- Reusable containers shall not be opened, emptied or cleaned manually in any other manner, which would expose employees to the risk of percutaneous injury.
- Other Regulated Waste Containment. Regulated waste shall be placed in containers, which are:
  - Closable;
  - Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;
  - Labeled or color-coded according to labeling requirements of this Program.
  - Compliant with current DOT regulations for shipment.
- Disposal of all regulated waste shall be in accordance with applicable regulations of the United States, States and Territories and political subdivisions of States and Territories.
- Laundry. Dispose of all contaminated clothing as regulated waste.

### **Hepatitis B Vaccination and Post Exposure and follow-up.**

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## Bloodborne Pathogens Program



Hepatitis B vaccine and vaccination series will be available to all employees who occupational exposure and post exposure evaluation and follow-up to all employees who have had an exposure incident.

All medical evaluations and procedures including the hepatitis B vaccine and vaccination series and post exposure evaluation and follow-up, including prophylaxis, are:

- Made available at no cost to the employee;
- Made available to the employee at a reasonable time and place;
- Performed by or under the supervision of a licensed physician or by or under the supervision of another licensed healthcare professional; and
- Provided according to recommendations of the U.S. Public Health Service current at the time these evaluations and procedures.
- An accredited laboratory at no cost to the employee conducts all laboratory tests.

### **Hepatitis B Vaccination.**

- Shall be made available after the employee has received the training required within this Standard and within 10 working days of initial assignment to all employees who have occupational exposure unless the employee has previously received the complete hepatitis B vaccination series, antibody testing has revealed that the employee is immune or the vaccine is contraindicated for medical reasons.
- Shall not make participation in a pre-screening program a prerequisite for receiving hepatitis B vaccination.
- If the employee initially declines hepatitis B vaccination but at a later date while still covered under the Program decides to accept the vaccination, The ABM management shall make available hepatitis B vaccination at that time.
- Employees who decline to accept hepatitis B vaccination offered by the Company sign the Hepatitis B Vaccine Declination Form
- If a routine booster dose(s) of hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster dose(s) shall be made available under the same conditions as the initial vaccination process.

### **Post-Exposure and Follow-up.**

Following a report of an exposure incident, the Company shall make immediately available to the exposed employee a confidential medical evaluation and follow-up, including at least the following elements:

- Documentation of the route(s) of exposure and the circumstances under which the exposure incident occurred;
- Identification and documentation of the source individual, unless the establishment that identification is infeasible or prohibited by state or local law;
- The source individual's blood shall be tested as soon as feasible and after consent is obtained in order to determine HBV and HIV infectivity. If consent is not obtained, The ABM management shall establish that



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legally required consent cannot be obtained. When law does not require the source individual consent, the source individual's blood, if available, shall be tested and the results documented.

- When the source individual is already known to be infected with HBV or HIV, testing for the source individual's known status need not be repeated.
- Results of the source individual's testing shall be made available to the exposed employee and the employee shall be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.
- Collection and testing of blood for HBV and HIV serological status;
- The exposed employee's blood shall be collected as soon as feasible and tested after consent is obtained.
- If the employee consents to baseline blood collection, but does not give consent at that time for HIV serologic testing, the sample shall be preserved for at least 90 days. If, within 90 days of the exposure incident, the employee elects to have the baseline sample tested, such testing shall be done as soon as feasible.
- Post-exposure prophylaxis, when medically indicated, as recommended by the U.S. Public Health Service;
- Counseling; and
- Evaluation of reported illnesses.

### **Information provided to the Healthcare Professional.**

The healthcare professional evaluating the employee after an exposure incident will be provided with the following:

- Provided a copy of the Bloodborne Pathogens regulation.
- A description of the exposed employee's duties as they relate to the exposure incident;
- Documentation for the route(s) of exposure and circumstances under which exposure occurred;
- Results of the source individual's blood testing, if available; and
- All medical records relevant to the appropriate treatment of the employee including vaccination status.

### **Healthcare Professional's Written Opinion**

Provide the employee with a copy of the evaluating healthcare professional's written opinion within 15 days of the completion of the evaluation.

- The healthcare professional's written opinion for Hepatitis B vaccination shall be limited to whether Hepatitis B vaccination is indicated for an employee, and if the employee has received such vaccination.
- The healthcare professional's written opinion for post-exposure evaluation and follow-up shall be limited to the following information.
- Employee has been informed of the results of the evaluation; and
- Employee has been told about any medical conditions resulting from exposure to blood or OPIM which require further evaluation or treatment.
- All other findings or diagnoses shall remain confidential and shall not be included in the written report.

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## Bloodborne Pathogens Program



### Medical Record-keeping

Medical records required by this standard shall be maintained in accordance with the record-keeping section of this program.

### Communication of Hazards to Employees

Labels and Signs.

Labels.

- Warning labels shall be affixed to containers of regulated waste, refrigerators and freezers containing blood or OPIM; and other containers used to store, transport or ship blood or OPIM, except where indicated.
- Labels required by this section shall include the following legend: BIOHAZARD (Need symbol)
- Labels shall be fluorescent orange or orange-red or pre-dominantly so, with lettering and symbols in a contrasting color.
- Labels shall be affixed as close as feasible to the container by string, wire, adhesive or other method that prevents their loss or unintentional removal.
- Red bags or red containers may be substituted for labels.
- Containers of blood, blood components or blood products that are labeled as to their contents and have been released for transfusion or other clinical use are exempted from these label requirements.
- Individual containers of blood or OPIM that are placed in a labeled container during storage, transport, shipment or disposal are exempted from the labeling requirement.
- Labels required for contaminated equipment shall be in accordance with this section and shall also state which portions of the equipment remain contaminated.
- Regulated waste that has been decontaminated need not be labeled or color-coded.
- Signs.
- Post signs at the entrance to affected work areas and/or containers which shall bear the following legend:
  - BIOHAZARD (Need symbol)
  - Name of the infectious agent
  - Special requirements for entering the area
  - Name, telephone number of responsible person
- Signs shall be fluorescent orange-red or pre-dominantly so, with lettering and symbols in a contrasting color.

### Information and Training

Employees with occupational exposure will participate in a training program, which must be provided at not cost to the employee and during working hours.

**Training shall be provided as follows:**

# ABM Technical Addendum

## Bloodborne Pathogens Program



- At the time of initial assignment to tasks where occupational exposure may take place;
- Within 90 days after the effective date of the Standard; and
- At least annually thereafter.
- For employees who have received training on bloodborne pathogens in the year preceding the effective date of the standard, only training with respect to the provisions of the standard which were not included need to be provided.
- Annual training for all employees shall be provided within one year of their previous training.
- Provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affect the employee's occupational exposure. Additional training may be limited to addressing the new exposures created.
- Material appropriate in content and vocabulary to educational level, literacy and language of employees shall be used.

### **Training program shall contain at a minimum the following elements:**

- Copy of the regulatory text and an explanation of its contents;
- Modes of transmission of bloodborne pathogens;
- Company's Exposure and Control Plan and the means that an employee can obtain a copy of the written plan;
- Appropriate means for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;
- Use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices and PPE;
- Types, proper use, location, removal, handling, decontamination and disposal of PPE;
- Basis for selection of PPE;
- Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated and that the vaccine and vaccination will be offered free of charge;
- Appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;
- Procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;
- Post-exposure evaluation and follow-up that the Company is required to provide for the employee following an exposure incident;
- Signs and labels and/or color coding required by this Program;
- Opportunity for interactive question's and answer's with the person conducting the training session.
- The training person shall be knowledgeable in the subject matter covered by the elements contained in the training program as it related to the workplace.



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## Bloodborne Pathogens Program



### Record Retention

#### *Medical Records*

The Company shall establish and maintain an accurate record for each employee with occupational exposure, in accordance with 29 CFR 1910.20. This record shall include:

- Employee's name and social security number
- Copy of hepatitis B vaccination status including the dates of all the hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination
- Copy of all examination results, medical testing and follow-up procedures
- Employer's copy of the healthcare professional's written opinion
- Copy of information provided to the healthcare professional at the time of evaluation

### Confidentiality

The Company will ensure that all employees' medical records will remain confidential and not disclosed without the employee's written consent to any person within or outside the workplace except as required by this Program or as required by law. Employee records will be maintained for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.20.

#### *Training Records*

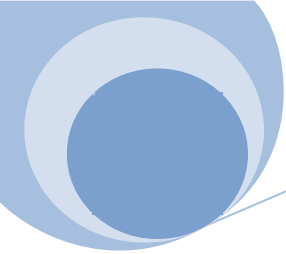
Training records shall be maintained for 3 years from the date on which the training occurred.

Employee training records shall include:

- Dates of the training sessions;
- Contents and summary of the training sessions;
- Names and qualifications of persons conducting the training;
- Names and job titles of all persons attending the training sessions.

### References

29 CFR 1910.103 Bloodborne Pathogen Standards  
29 CFR 1910.20 Access to Medical Records



# ABM Technical Addendum

## Bloodborne Pathogens Program



CONFIDENTIAL

Employee Consent Form to Receive the Hepatitis B Vaccine

If employee refuses Hepatitis vaccination the Declination Form shall be signed and dated.

The Hepatitis B vaccine is prepared from recombinant yeast culture and is free of association with human blood or blood products.

If I am allergic to yeast or thimersol, I should not receive this vaccine.

If I have a serious, active infection, I should not receive this vaccine.

If I am on hemodialysis, I should not receive this vaccine without further evaluation.

If I am pregnant, or trying to become pregnant, or breast feeding, I must obtain authorization from my personal physician before receiving this vaccine.

If I have taken a drug or undergone treatment that lowers the body's resistance to infection, I should not take this vaccine without further evaluation.

If I have an immune deficiency, I should not take this vaccine without further evaluation.

If I have heart or lung problems, I should not take this vaccine without further evaluation.

If I have any bleeding disorder that prevents me from receiving an intra-muscular shot, I should not have this vaccine without further evaluation.

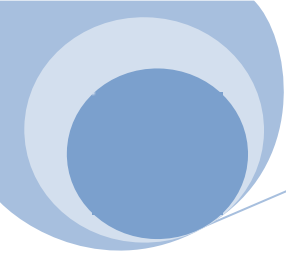
I have been informed regarding Hepatitis B vaccine.

**I have been notified of my susceptibility to Hepatitis B and have been made aware of the consequences to co-workers, family, and myself as well as of the fact that my employer strongly urges me to obtain a Hepatitis B vaccination. I have had a chance to ask questions that were answered to my satisfaction.**

Employee's Signature \_\_\_\_\_

S.S. # \_\_\_\_\_

Date elected to receive vaccine: \_\_\_\_\_



# ABM Technical Addendum

## Bloodborne Pathogens Program



Witness: \_\_\_\_\_

Injection Dates: First Dose \_\_\_\_\_

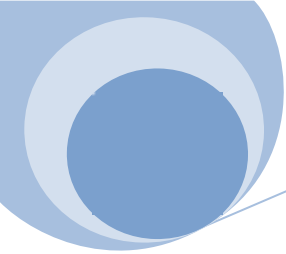
Second Dose \_\_\_\_\_

Third Dose \_\_\_\_\_

### Hepatitis B Vaccine Declination Form

I understand that due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring the Hepatitis B virus (HBV). I have been given the opportunity to be vaccinated with Hepatitis B vaccine at no charge to myself. However, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with the Hepatitis B vaccine, I can receive the vaccination at no charge to me.

|   |                           |             |
|---|---------------------------|-------------|
| _____                                   | _____                     | _____       |
| <b>Employee Name (Print) &amp; S.S#</b> | <b>Employee Signature</b> | <b>Date</b> |
| _____                                   | _____                     | _____       |
| <b>Witness Name (Print)</b>             | <b>Witness Signature</b>  | <b>Date</b> |



# ABM Technical Addendum

## Bloodborne Pathogens Program



### Post Exposure Evaluation and Follow-Up

Employee Name: \_\_\_\_\_ Job Title: \_\_\_\_\_

Soc. Sec. #: \_\_\_\_\_ Home Phone: \_\_\_\_\_ Work: \_\_\_\_\_

Date of the incident \_\_\_\_\_ where the incident occurred: \_\_\_\_\_

Nature of the incident (i.e.; splashed exposed membrane) \_\_\_\_\_

Please describe the tasks being performed when the occurred: \_\_\_\_\_

Personal Protective Equipment being used? Yes \_\_\_\_\_ No \_\_\_\_\_ If "yes" list: \_\_\_\_\_

What body parts became exposed: \_\_\_\_\_

Medical attention required? Will Seek \_\_\_\_\_ Yes \_\_\_\_\_ No If "will seek" or "yes" explain, where, when and by whom: \_\_\_\_\_

### The following is the exposed employee's written consent to be tested.

I \_\_\_\_\_ request that my blood be tested after having been involved in an occupational exposure. I have also made the following choice concerning serological testing. **Circle one response**  
(Print Name)

- A) I choose not to have my blood baseline test and refuse at this time serological testing.
- B) I choose to have a serological test of my blood at this time.

Note: If the employee chooses not to have the serological test he/she has 90 days to have the initial sample tested. The sample shall be preserved for 90 days. The exposed employee's blood shall be collected as soon as possible when their consent is given.

\_\_\_\_\_  
**Exposed Employee's Signature**

\_\_\_\_\_  
**Date**

Note: When medically indicated post-exposure prophylaxis and counseling shall be recommended and conducted by the health care professional.



# ABM Technical Addendum

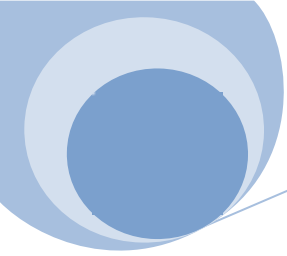
## Bloodborne Pathogens Program



**Please send the following information to the Healthcare Provider:**

- A) *Copy of the Standard,*
- B) *Results of source individuals blood test (if possible),*
- C) **Post Exposure Evaluation and Follow-Up**
- D) *All relevant medical treatment information.*





# ABM Technical Addendum

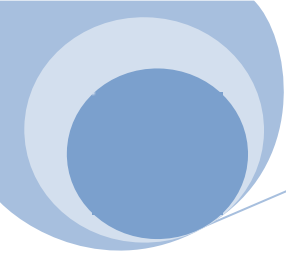
## Bloodborne Pathogens Program



### Exposure Determination Inventory

The following Exposure Determination Inventory lists employee job classifications, job tasks and potential exposures for employees assigned to the \_\_\_\_\_ Facility.

| <u><b>Employee Job Classification</b></u> | <u><b>Job Tasks</b></u> | <u><b>Potential Exposures</b></u> |
|---|-------------------------|-----------------------------------|
| _____                                     | _____                   | _____                             |
| _____                                     | _____                   | _____                             |
| _____                                     | _____                   | _____                             |
| _____                                     | _____                   | _____                             |
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| _____                                     | _____                   | _____                             |



# ABM Technical Addendum

## Bloodborne Pathogens Program



### Bloodborne Pathogens Exposure and Control Plan

All blank's must be completed by the Facility Manager, after completing these blanks this document must be kept on file in the Facility Managers Office. This is the site specific Bloodborne Pathogen Plan.

**Facility Name and Address:** \_\_\_\_\_

**Facility Manager:** \_\_\_\_\_ **Date of Evaluation:** \_\_\_\_\_

The following Bloodborne Pathogens Exposure and Control Plan is intended to provide basic site controls for all employees'. In the event, local standards and/or our client has a more stringent program, the Company will make every effort to conform to the stricter of the requirements.

#### I. Facility Manager Responsibility

The Facility Manager will be responsible for the overall management of this facility's Bloodborne Pathogens Compliance Program.

#### Purpose of the Plan

This plan is intended to eliminate and/or reduce occupational exposures to Hepatitis B Virus (HBV), Human Immunodeficiency Virus (HIV) and other bloodborne pathogens.

Our facility shall institute work practices that minimize employee exposure to bloodborne pathogens. Risk of exposure to bloodborne pathogens should never be underestimated. Two main plan objectives are:

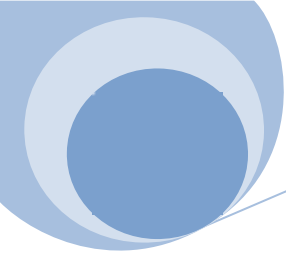
- 1) To provide protection to all ABM employees from the health hazards associated with bloodborne pathogens.
- 2) To provide assurance that the appropriate treatment and counseling will be provided should an employee be exposed to bloodborne pathogens.

#### Exposure Determination

Facility managers will ensure an Exposure Determination Inventory (see Form \_\_\_\_ ) concerning the employees' occupational exposure to blood or OPIM is completed. The exposure determination is made without regard to the use of personal protective equipment (PPE), (i.e., employees are considered to be exposed even if they wear the proper PPE.) The Exposure Determination Inventory is required to list all job classifications in which employees may encounter while performing their work duties, despite the frequency of these tasks. See the attached Exposure Determination Inventory for job classifications with a potential for exposure to bloodborne pathogens.

#### IV. Implementation

The Bloodborne Pathogens Exposure & Control Plan implementation schedule is outlined below:



# ABM Technical Addendum

## Bloodborne Pathogens Program



- A. New hire employee orientation. All newly hired employees receive a basic program orientation within 10 days.
- B. Annual training of Bloodborne Pathogens will be conducted at this facility.
- C. Initial management training for all new management personnel.

### V. Methods of Compliance

The ABM practices Universal Precautions, which means that all bodily fluids are treated as if they were infected with a bloodborne pathogen. Engineering and work practice controls will be utilized to eliminate or minimize exposure to our employees. The following engineering controls will be utilized at this facility:

- A. Only by qualified personnel shall administer first aid treatment.
- B. Employees must wash their hands as soon as feasible after removal of potentially contaminated gloves or other personal protective equipment.
- C. Upon contact with blood or any OPIM, employees must wash their hands and any other exposed skin with soap and water as soon as possible. Mucous membranes shall be flushed with water.
- D. Any company responsible contaminated equipment or work area shall be decontaminated prior to use.
- E. Employees who are trained to administer first aid will utilize appropriate personal protective equipment. The only exception to this is when an employee judges that the use of protective equipment would prevent them from performing a needed medical or emergency procedure or would increase their exposure or their co-workers exposure to a pathogen. If an employee makes this determination the situation will be investigated and documented by the facility manager.

The above controls will be examined and maintained on a regular basis. This facility will review the effectiveness of these controls:

***Annually and whenever job tasks or responsibilities are changed or implemented which may affect the employee's occupational exposures.***

### VI. Personal Protective Equipment

This facility provides the following personal protective equipment to employees:

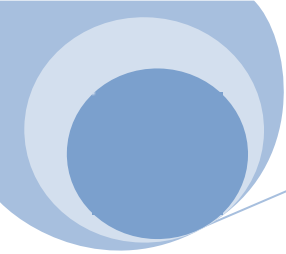
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#### (Site specific PPE)

\_\_\_\_\_ is responsible for ensuring that appropriate personal protective equipment be available to  
**(Facility Manager)**  
employees. The equipment is provided at no cost to our employees.

This Facility Manager will ensure that personal protective equipment will be available and acceptable for use. The following practices will be adhered to:

*All personal protective equipment will be disposed of after use.*



# ABM Technical Addendum

## Bloodborne Pathogens Program



*An adequate supply of disposable gloves will be available at this facility.*

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***(Other site specific standards practiced.)***

All employees are trained regarding the accessibility and use of personal protective equipment relative to their job and the work process they perform which potentially could expose them to an occupational exposure. Overall occupational exposures are collateral in nature but primary functions are noted on the “Job Exposure Determination Worksheet”.

### **VII. Hand-washing Facilities**

If an employee becomes exposed to blood or OPIM, hand-washing facilities must be available. The Company requires that these facilities be readily accessible. The hand washing facilities for this facility are located:

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***(Location of Rest rooms or hand washing facilities)***

All employees are required to wash their hands immediately after or as soon as possible after an occupational exposure after removing their personal protective equipment. Employees are required to wash their hands with soap and water.

If an employee incurs an exposure to their skin or mucous membranes then those areas shall be washed or flushed with water as soon as possible after the contact.

### **VIII. Work Area Restrictions**

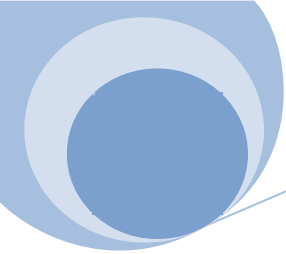
Employees may **not** eat, drink, apply cosmetics or lip balm, smoke, or handle contact lens in any area where there is a reasonable likelihood of exposure to blood or OPIM.

### **IX. Post-Exposure Evaluation and Follow-up**

When an employee is involved in an occupational exposure incident they are required to report the incident to their supervisor. All employees who are involved in an exposure incident will be offered post-exposure evaluation and follow-up in accordance with the Company’s Bloodborne Pathogen Program. Contaminated equipment shall be examined and shall be decontaminated as necessary using the proper cleansing agents. This facility will immediately begin the investigation process after the exposed individual and the exposure scene is properly secured. The following company forms will be used to document the situation:

#### **Post Exposure Evaluation and Follow Up**

- Identification and Documentation of Source Individual**
- Hepatitis B Vaccine Declination Form or**
- Bloodborne Pathogen Hepatitis B Vaccine Consent Form**



# ABM Technical Addendum

## Bloodborne Pathogens Program



The following is a synopsis of the events after an occupational exposure. Use the appropriate company forms to report the following:

- List the circumstances relating to the incident. Identify the specific the route(s) of entry. If possible, identify the source individual and their status. If the source individual consents to a blood test, a test for HIV and HBV will commence immediately.
- Testing results of the source individual will be made available to the exposed employee along with information on applicable laws concerning the disclosure of the source individual.
- The exposed employee will be provided the option of having their blood tested for HIV and HBV. The blood sample will be preserved for at least 90 days to allow the employee to decide if they want to be tested. The employee is free to decide whether or not to have the blood sampled within this 90-day period.
- According to the U.S. Public Health Service post-exposure prophylaxis will be offered.
- A designated healthcare professional will offer counseling concerning precautions to take during the period after the exposure incident.

***(Healthcare professional)***

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The following employee(s) have been identified as an exposed employee and they have been informed that the policy and procedures has completed and that the proper records are being maintained.

***(Facility Manager)***

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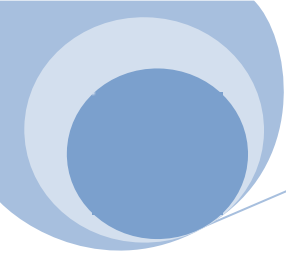
### ***IX. Health Care Providers***

In the event of a bloodborne pathogen exposure, the Company will provide the health care provider with the following information:

- Copy of the Bloodborne Pathogens Standard.
- Description of the exposed employee’s duties as they relate to the incident.
- Documentation of the route(s) of exposure and circumstances under which the exposure occurred.
- If possible, the results of the source individual’s blood test.
- Medical records relevant to the appropriate treatment of the exposed employee.

The health care professional will supply the Company with a copy of their written opinion regarding whether the Hepatitis B vaccination is needed for the employee and if the employee has received such vaccinations. The health care professional’s written opinion will be limited to the following:

- The employee has been informed of the results of the evaluation.
- The employee has been told about any medical conditions resulting from exposure that requires further evaluation or treatment.



# ABM Technical Addendum

## Bloodborne Pathogens Program



### **XI. Training**

Training will be conducted during working hours at no cost to the employees. All employee training will be conducted prior to initial assignment to tasks where occupational exposure may occur. All employees will also receive annual retraining.

Training at this facility will include an explanation of:

- OSHA's Bloodborne Pathogens' Standard, 29 CFR 1910.1030.

- The epidemiology and symptoms of bloodborne disease.

- Modes of transmission of bloodborne pathogens.

- The Exposure and Control Plan and accessibility.

Procedures that might involve the possible exposure to blood and other infectious materials.

- Methods that will prevent or reduce exposures including appropriate engineering controls, work practices, and personal protective equipment.

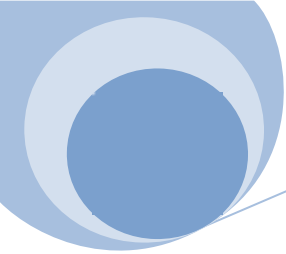
- Personal protective equipment available at this facility and it's use.

- Exposure incident procedures.

- Post-exposure and follow-up.

Employees will have an opportunity to ask questions of the person conducting the training.

The training will be documented and all in attendance will sign off acknowledging their participation.



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



### **CAL/OSHA Heat Illness Prevention Program**

#### **1.0 Purpose**

Heat illness in all its forms has always been a recognized work hazard in California. Cal/OSHA requires employers in California to train workers regarding the hazards of working in heat and in heat related illness. The standard also requires employers to have a written plan that informs employees, supervisors, and managers of the regulatory requirements the company must adhere to related to heat related illness prevention.

The primary goal of the ABM Heat Illness Prevention plan is employee safety. The training and operational elements found in this plan will provide employees, managers and supervisors with the tools necessary to anticipate environmental conditions that contribute to heat related illness, to recognize when work assignments place employees at risk and what job instructions need to be communicated to employees regarding the prevention of heat related illness.

This plan is consistent with the requirements of the Injury and Illness Prevention Plan (IIPP), and nothing in this program supersedes or nullifies the requirements found in our IIPP

#### **2.0 Scope**

The Heat Illness Prevention Plan (HIPP) is intended to control occurrence of heat related illness. The Plan applies to all outdoor areas where employees can be assigned work, and where environmental conditions cannot be mitigated by engineering controls.

Additionally, the Plan also applies to indoor areas where employees may be assigned work, where the indoor temperature meets or exceeds 95° F. The Plan is also applicable to emergency response personnel, or other employees who are required to wear and perform work in full - body personal protective suits, regardless of exterior or interior ambient temperatures.

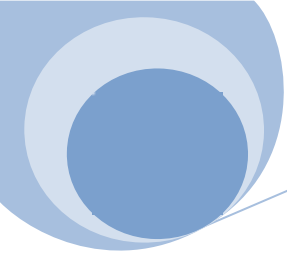
#### **3.0 Responsibilities**

##### **3.1 ABM will:**

- draft and distribute the HIPP to managers and supervisors.
- provide initial training in the requirements of the plan to managers, supervisors, and employees who are covered by the requirements of this program.
- maintain employee training records for courses conducted.

##### **3.2 Managers and supervisors will:**

- ensure that employee work assignments both indoors and outdoors are evaluated and the components of this plan are implemented when the established temperature/relative humidity thresholds are met or exceeded.
- ensure that initial and periodic training is provided to employees under their supervision and are consistent with the requirements of this document.
- Ensure that active or passive cooling equipment is available to employees who may require it's use.
- maintain employee training records for courses conducted.



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



### 3.3 Employees will:

- comply with the requirements of this plan.
- understand the responsibilities of both the company and employees in maintaining compliance with this plan.
- take steps to mitigate any personal risk factors that may exist prior to working in a regulated hot environment.
- Immediately report unsafe conditions to their supervisor.
- Observe their fellow employees for signs of heat related illness, and take quick action to ensure that rapid assistance is provided if applicable.

### 4.0 Definitions

**"Acclimatization"** means temporary adaptation of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work for at least two hours per day in the heat.

**"Active Cooling Equipment"** – Clothing or powered devices (passive or active) that work to provide body core cooling when worn by an employee.

**"Heat Illness"** means a serious medical condition resulting from the body's inability to cope with a particular heat load, and includes heat cramps, heat exhaustion, heat syncope and heat stroke.

**"Environmental risk factors for heat illness"** means working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.

**"Full-body Protective Clothing"** – means clothing or a protective suit that can provide a protective barrier to prevent dermal contact with a full range of materials from ordinary nonhazardous soiling agents to aggressive hazardous material/chemical substances. This suit provides body protection including head (hood) and feet (integrated booties).

**"Personal risk factors for heat illness"** means factors such as an individual's age, degree of acclimatization, health, water consumption, alcohol consumption, caffeine consumption, and use of prescription medications that affect the body's water retention or other physiological responses to heat.

**"Preventative recovery period"** means a period of time to recover from the heat in order to prevent heat illness.

**"Shade"** means blockage of direct sunlight. Canopies, umbrellas and other temporary structures or devices may be used to provide shade. One indicator that blockage is sufficient is when objects do not cast a shadow in the area of blocked sunlight. Shade is not adequate when heat in the area of shade defeats the purpose of shade, which is to allow the body to cool. For example, a car sitting in the sun does not provide acceptable shade to a person inside it, unless the car is running with air conditioning.

### 5.0 Program Requirements / Procedure





# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



### 5.1 Provisions for Water

Water is a key preventative measure to minimize the risk of heat-related illness. All employees working outdoors will have access to potable drinking water. If the supply of water to the jobsite is not plumbed or otherwise continuously supplied, water will be provided in sufficient quantity at the beginning of the work shift to provide at least one quart per employee per hour for drinking for the entire shift. If a work shift is begun with a smaller quantity of water, water will be replenished during the shift as needed to allow employees to drink one quart or more per hour.

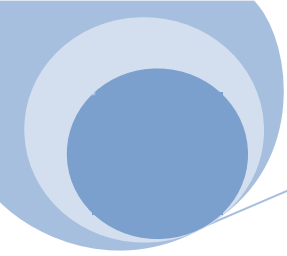
To ensure access to sufficient quantities of potable drinking water, the following steps will be taken:

- A supervisor or designated person will ensure that there is at least two quarts of drinking water available per employee at the start of a shift.
- The designated person(s) will monitor the water level of all containers every 30 minutes, and more frequently when the temperature exceeds 90°F. Employees are encouraged to report low water levels or dirty water to the supervisor or designated person(s).
- When drinking water levels within a container fall below 50%, water containers will be refilled with cool water. To accomplish this task, the designated person(s) will carry one or two additional water containers (e.g., five gallon bottles) to replace water as needed.
- When the temperature exceeds 90°F or during a heat wave, the designated person(s) will carry ice in separate containers so that, when necessary, it can be added to the drinking water to keep it cool.
- The designated person(s) will bring enough paper cone rims or bags of disposable cups and the necessary cup dispensers to ensure that enough cups are made available for each worker and that they are kept clean until used.
- The designated person(s) will check the worksite and place the water as close as possible to the workers (i.e., no more than 50 feet from the workers). If field terrain prevents the water from being placed as close as possible to the workers, the designated person(s) will bring bottled water or individual containers, in addition to disposable cups and water containers, so that workers will have readily accessible drinking water.
- The designated person(s) will ensure that the water containers are relocated to follow along as the crew moves, so that drinking water will be readily accessible.
- The designated person(s) will point out daily the location of the water coolers to the workers and remind them to drink water frequently.
- The designated person(s) will be responsible for cleaning the water containers and ensuring that they are kept in sanitary condition. All necessary cleaning supplies will be provided by the company, or the designated person(s) will be reimbursed by the company.
- The company will reimburse the designated person(s) for any costs incurred for filling up water containers as needed on a daily basis or to purchase necessary disposable cups.
- When the temperature equals or exceeds 95°F or during a heat wave, the designated person(s) will increase the number of water breaks and will remind workers more frequently throughout the work shift to drink water.

The frequent drinking of potable water will be encouraged. During training, the importance of frequent drinking of water will be stressed.

To encourage frequent drinking of water, the following steps will be taken:

- Supervisors will provide frequent reminders to employees to drink water often.



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



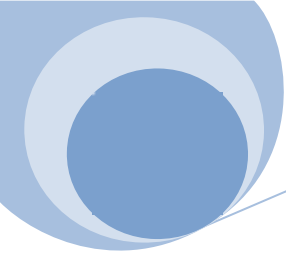
- During heat waves or other severe working or environmental conditions, additional water breaks will be provided as required, and supervisors will provide more frequent reminders to drink water.
- A short tailgate meeting will be held each morning to remind workers (in their own language) about the importance of frequent consumption of water throughout the shift.
- A noise-making device, such as an air horn, may be used to remind employee's to take their water break.

### 5.2 Access to Shade

Access to rest and shade or other cooling measures are important preventative steps to minimize the risk of heat-related illness. Employees suffering from heat illness or who believe preventative recovery periods are needed will be provided access to an area with shade that is either open to the air, or they will be provided with ventilation or cooling, for a period of no less than five minutes. Such access to shade will be permitted at all times. Cooling measures other than access to shade, such as the use of misting machines, may be provided in lieu of shade if it can be demonstrated that the measures are at least as effective as shade in allowing employees to cool.

To ensure access to shade and a preventative recovery period at all times, the following steps will be taken:

- The designated person(s) will bring shade structures to the site so that at least 25% of the employees on the shift can be shaded at one time. The designated person(s) will also bring chairs, benches, sheets, towels, or other items that will allow those employees to sit and rest without contacting the bare ground. However, chairs, benches, etc., are not required for acceptable sources of shade such as trees.
- When the temperature equals or exceeds 80°F, the designated person will ensure that the shade structures are opened and placed as close as practical to the workers. When the temperature is below 80°F, the shade structures will be brought to the site, but will be opened and set in place upon request by a worker. The interior of a vehicle will not be used to provide shade unless the vehicle is air-conditioned and the air conditioner is on.
- The designated person(s) will ensure that the shade structures are relocated to follow along with the crew, double-checking that the shade structures are as close as practical to the employees, so that access to shade is provided at all times.
- In situations where trees or other vegetation are used to provide shade (such as in orchards), the designated person will evaluate the thickness and shape of the shaded area, given the changing angles of the sun during the entire shift, before assuming that sufficient shadow is being cast to protect employees.
- The designated person(s) will point out the daily location of the shade structures to the workers.
- Workers will be allowed and encouraged to take a five-minute rest in the shade when they feel they need to do so to protect themselves from overheating.
- In situations where it is not safe to provide shade (e.g., winds are more than 40 mph), the designated person will document how this determination was made and what steps will be taken to provide shade upon request.
- In situations where it is not safe or feasible to provide shade, the designated person will document how this determination was made and what steps will be taken to provide shade upon request or what other alternative cooling measures with equivalent protection will be used.
- A short tailgate meeting will be held each morning to remind workers about the importance of rest breaks and the location of shade.
- Whenever possible, areas for employees to take their breaks in will be:
  - readily accessible,
  - in the shade, open to the air, and ventilated or cooled, and – near sufficient supplies of drinking water.



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



### 5.3 Monitoring the Weather

In order to know whether a heat wave is expected or if schedule modification will be necessary, the following steps will be taken:

- The supervisor will be trained and instructed to check in advance the extended weather forecast. Weather forecasts can be checked with the aid of the internet (<http://www.nws.noaa.gov/>), or by calling the National Weather Service phone numbers (see CA numbers below) or by checking the Weather Channel TV Network. The work schedule will be planned in advance, taking into consideration whether high temperatures or a heat wave is expected. This type of advance planning should take place all summer long.

#### CALIFORNIA Dial-A-Forecast

|                               |                                   |
|-------------------------------|-----------------------------------|
| Eureka 707-443-7062           | • Sacramento 916-979-3051         |
| Hanford 559-584-8047          | • San Diego 619-297-2107 (#1)     |
| Los Angeles 805-988-6610 (#1) | • San Francisco 831-656-1725 (#1) |

- Prior to each workday, the forecasted temperature and humidity for the worksite will be reviewed and will be compared against the National Weather Service Heat Index to evaluate the risk level for heat illness. Determination will be made of whether or not workers will be exposed at a temperature and humidity characterized as either “extreme caution” or “extreme danger” for heat illnesses. It is important to note that the temperature at which these warnings occur must be lowered as much as 15 degrees if the workers under consideration are in direct sunlight.
- Prior to each workday, the supervisor will monitor the weather (using <http://www.nws.noaa.gov/> or with the aid of a simple thermometer, available at most hardware stores) at the worksite. This critical weather information will be taken into consideration, to determine, when it will be necessary to make modifications to the work schedule (such as stopping work early, rescheduling the job, working at night or during the cooler hours of the day, increasing the number of water and rest breaks).
- A thermometer will be used at the jobsite to monitor for sudden increases in temperature, and to ensure that once the temperature exceeds 80 degrees Fahrenheit, shade structures will be opened and made available to the workers. In addition, when the temperature equals or exceeds 95 degrees Fahrenheit, additional preventive measures such as the High Heat Procedures will be implemented.

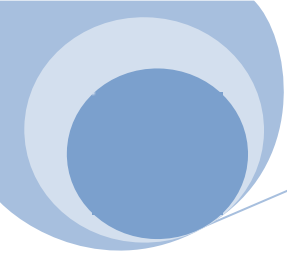
### 5.4 High Heat Procedures

High Heat Procedures are the additional preventive measures that this company will use when the temperature equals or exceeds 95°F.

To reduce the risk of heat-related illness during times of high heat, the following steps will be taken:

*(Note: Per the regulations, High Heat Procedures apply to agriculture, construction, landscaping, oil and gas extraction, and transportation of agricultural products, construction products, and other heavy materials. However, use of High Heat Procedures in all industries requiring outdoor work will ensure a safer workplace.)*

- Effective communication by voice, direct observation (applicable for work crews of 20 or fewer), mandatory buddy system, or electronic means will be maintained, so that employees at the worksite can contact a



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



supervisor when necessary. If the supervisor is unable to be near the workers (to observe them or communicate with them), then an electronic device, such as a cell phone or text messaging device, may be used for this purpose if reception in the area is reliable.

- Frequent communication will be maintained with employees working by themselves or in smaller groups (keep tabs on them via phone or two-way radio), to be on the lookout for possible symptoms of heat illness. The employee(s) will be contacted regularly and as frequently as possible throughout the day, since an employee in distress may not be able to summon help on his or her own.
- Effective communication and direct observation for alertness and/or signs and symptoms of heat illness will be conducted frequently. When the supervisor is not available, a designated alternate responsible person must be assigned, to look for signs and symptoms of heat illness. If a supervisor, designated observer, or any employee reports any signs or symptoms of heat illness in any employee, the supervisor or designated person will take immediate action commensurate with the severity of the illness (see Emergency Response Procedures).
- Employees will be reminded constantly throughout the work shift to drink plenty of water and take preventative cool-down rest break when needed.
- The designated person will closely supervise all new employees, or a “buddy” or more experienced co-worker will do so, for the first 14 days of employment, unless the new employee indicates at the time of hire that he or she has been doing similar outdoor work for at least 10 of the past 30 days for four or more hours per day.

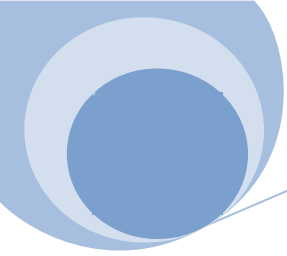
### 5.5 Handling A Heat Wave

For purposes of this section only, “heat wave” means any day in which the predicted high temperature for the day will be at least 80 degrees Fahrenheit and at least ten degrees Fahrenheit higher than the average high daily temperature in the preceding five days.

- During a heat wave or spike, if possible, the work day will be cut short, will be rescheduled (i.e., to night work or during cooler hours), or cease for the day.
- If schedule modifications are not possible or feasible and workers have to work during a heat wave, the designated person(s) will conduct a tailgate meeting to reinforce heat illness prevention and emergency response procedures and to discuss the weather forecast. In addition, the designated person(s) will institute alternative preventive measures such as increased number of water and rest breaks, increased supervision to ensure that workers stop and take these breaks, and close observation of all workers for signs and symptoms of heat illness. Each employee will also be assigned a “buddy” to be on the lookout for signs and symptoms of heat illness and ensure that emergency procedures are initiated when their buddy displays possible signs or symptoms of heat illness.
- Current weather information will be used to make the appropriate adjustments in work activities throughout the work day. The designated person(s) will monitor the weather at the specific job locations where work activities are occurring and will stay updated throughout the work shift on the changing air temperatures and other environmental factors.
- If necessary, alternative cooling measures in addition to shade (e.g., allowing employees to spend time in an air-conditioned place or having employees spray themselves with water) will be used.

### 5.6 Procedures for Acclimatization

Acclimatization is the temporary and gradual physiological change in the body that occurs when the environmentally induced heat load to which the body is accustomed is significantly and suddenly exceeded by sudden environmental changes. In more common terms, the body needs time to adapt when temperatures rise suddenly, and an employee risks heat illness by not taking it easy when a heat wave strikes or when starting a new job that exposes the employee to heat to which the employee’s body hasn’t yet adjusted.



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



Inadequate acclimatization can be significantly more perilous in conditions of high heat and physical stress. Employers are responsible for the working conditions of their employees, and they must act effectively when conditions result in sudden exposure to heat their employees are not used to.

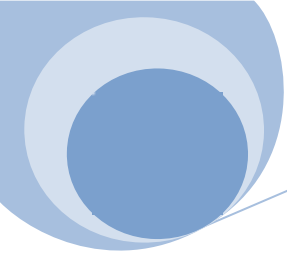
- The designated person will monitor the weather and be on the lookout for sudden heat waves or increases in temperatures to which employees have not been exposed to for several weeks or longer.
- During a heat wave or heat spike, if possible and feasible, the work day will be cut short, work will be rescheduled to night or cooler hours, or cease for the day.
- During the hot summer months, the work shift will start two hours earlier in the day or later in the evening.
- For new employees, the designated person(s) will attempt to lessen the intensity of that employee’s work during a two-week break-in period by scheduling slower-paced, less physically demanding work during the hot parts of the day and scheduling the heaviest work activities during the cooler parts of the day. The designated person(s) will be extra-vigilant with new employees and will stay alert to the presence of heat-related symptoms. In addition, the designated person will assign a “buddy” or experienced co-worker to new employees in order to monitor closely for discomfort or symptoms of heat illness. Steps taken to lessen the intensity of the workload for new employees will be documented.
- During a heat wave or spike, the designated person will observe all employees closely (or maintain frequent communication via phone or radio) and be on the lookout for possible symptoms of heat illness.
- Employee and supervisor training will include the importance of acclimatization, how it is developed, and how the company’s Heat Illness Prevention Plan addresses it.

### 5.7 Reducing Risk

Written procedures help to reduce the risk of heat-related illnesses and ensure that emergency assistance is provided without delay. These written procedures will be made available to employees and Cal/OSHA representatives upon request.

To reduce the risk of heat-related illness and respond to possible symptoms of heat illness, the following general steps will be taken:

- All employees will be trained prior to working outdoors.
- Working hours will be modified, when possible, so that work is performed during the cooler hours of the day.
- When a modified or shorter work shift is not possible, more water and rest breaks will be provided.
- Supervisors will continuously check all employees and will stay alert to the presence of heat-related symptoms.
- Co-workers will use a “buddy system” to watch each other closely for discomfort or symptoms of heat illness.
- Supervisors and co-workers are encouraged to never discount any signs or symptoms they are experiencing or noticing, and will immediately report them.
- Supervisors will carry cell phones or other means of communication to ensure that emergency services can be called. Supervisors will check that these means of communication are functional on the jobsite prior to each shift.
- A short tailgate meeting will be held each morning to remind workers (in their own language) about the address and directions to the jobsite and emergency procedures.
- We will allow all employees to acclimatize to the heat.



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



- All supervisors will monitor weather conditions throughout the work shift at the specific jobsite. Based on current weather information and worker input from the field, supervisors will implement any additional measures necessary to address heat illness.
- A supervisor or designated person will account for the whereabouts of all crews at appropriate intervals throughout the work shift and at the end of the work shift.

### 5.8 Emergency Response

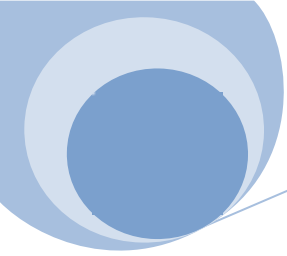
To ensure that emergency medical services are provided without delay, the following steps will be taken.

**5.8.1** Procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided, should they become necessary, are:

- When an employee displays possible signs or symptoms of heat illness, a trained first aid worker or supervisor will check the sick employee and determine whether resting in the shade and drinking cool water will suffice or if emergency service providers will need to be called. The designated person will contact emergency service providers if necessary. Under no circumstances will a sick worker be left alone in the shade.
- When an employee displays possible signs or symptoms of heat illness and no trained first aid worker or supervisor is available at the site, the designated person will call emergency service providers.
- The designated person will call emergency service providers immediately if an employee displays signs or symptoms of heat illness, does not look OK, or does not get better after drinking cool water and resting in the shade. While the ambulance is in route, the designated person will cool the worker by placing him or her in the shade, removing excess layers of clothing, placing ice packs in the armpits of the victim, and fanning the victim. Sick workers will not be allowed to leave the site alone, as they can get lost or die before reaching the hospital.
- If an employee is displaying signs or symptoms of severe heat illness and the worksite is located more than 20 minutes away from a hospital, the designated person will call emergency service providers, communicate the signs and symptoms of the victim, and request an Air Ambulance.

**5.8.2** Procedures for Handling a sick employee:

- When an employee displays possible signs or symptoms of heat illness, a trained first aid worker or supervisor will check the sick employee and determine whether resting in the shade and drinking cool water will suffice or if emergency service providers will need to be called. A sick worker will not be left alone in the shade, as he or she can take a turn for the worse!
- When an employee displays possible signs or symptoms of heat illness and no trained first aid worker or supervisor is available at the site, emergency service providers will be called.
- Emergency service providers will be called immediately if an employee displays signs or symptoms of heat illness (decreased level of consciousness, staggering, vomiting, disorientation, irrational behavior, incoherent speech, convulsions, red and hot face), does not look OK or does not get better after drinking cool water and resting in the shade. While the ambulance is in route, first aid will be initiated (cool the worker: place the worker in the shade, remove excess layers of clothing, place ice pack in the armpits and groin area and fan the victim). Do not let a sick worker leave the site, as they can get lost or die before reaching a hospital!
- If an employee does not look OK and displays signs or symptoms of severe heat illness (decreased level of consciousness, staggering, vomiting, disorientation, irrational behavior, incoherent speech, convulsions, red and hot face), and the worksite is located more than 20 minutes away from a hospital, call emergency service providers, communicate the signs and symptoms of the victim and request Air Ambulance.



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



**5.8.3** Procedures for contacting emergency medical services and, if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider are:

- Prior to assigning a crew to a particular worksite, the designated person(s) will ensure that a qualified, appropriately trained, and appropriately equipped person will be available at the site to render first aid if necessary.
- Prior to the start of the shift, the designated person(s) will determine if a language barrier is present at the site and take steps (such as assigning the responsibility to call emergency medical services to the foreman or an English speaking worker) to ensure that emergency medical services can be immediately called in the event of an emergency.
- All foreman and supervisors will carry cell phones or other means of communication to ensure that emergency medical services can be called. Prior to each shift, each foreman and supervisor will check to make sure that the cell phone or other means of communication is functional at the worksite.
- At remote locations such as rural farms, lots, or undeveloped areas, the designated person will designate an employee or employees to physically go to the nearest road or highway where emergency responders can see them. If daylight is diminished, these employee(s) will be given reflective vests or flashlights in order to direct emergency personnel to the location of the worksite, which may not be visible from the road or highway.
- Prior to assigning a crew to a particular worksite, the designated person will provide workers and the foreman a map along with clear and precise directions (such as streets or road names, distinguishing features, and distances to major roads) to the site in order to avoid delay of emergency medical services.

### **5.9 Work in Full Body protective Clothing (FBPC)**

FBPC on certain jobsites for non-routine emergency response to hazardous materials releases and for routine maintenance/construction – related tasks.

When an employee wishes to wear a full – body protective suit (Tyvek, breathable Kleenguard, etc.) to solely prevent soiling street clothing from a routine work assignment, and no exposure to hazardous materials is anticipated, and the temperature is not expected to meet or exceed the HIPP action thresholds, the manager and/or supervisor shall comply with the following:

- Employees shall be advised to pre-hydrate before donning suit and beginning work.
- Employees shall be advised to continue drinking sufficient water to maintain a hydration rate of one 500ml bottle of water per hour.
- Employees shall be instructed to get out of the direct sun, and into a shaded area, for at least 5 minutes every hour.
- - When emergency conditions are present and the responders are required to protect themselves from any chemical, physical or biological hazard, the following work practices shall be implemented (by properly and currently trained staff):
  - Supervisors shall ensure that active cooling equipment is available for employee use, and that employees have been trained in the use of the equipment prior to work assignment.
  - Supervisors shall limit work assignments for employees to allow sufficient rest time for fluid replacement and restoration of nominal vital signs.
  - Every effort shall be made to schedule work in the coolest part of the day, usually early morning, to mitigate the need for active cooling equipment.
  - If conditions do not permit off hours scheduling, supervisors shall ensure that baseline vital signs for employees shall not exceed established thresholds.



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



### 6.0 Training

Training is critical to help reduce the risk of heat-related illnesses and to assist with obtaining emergency assistance without delay.

#### 6.1 Training for all employees

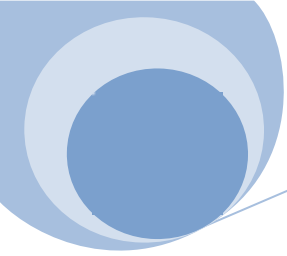
Procedures will be available to all employees as well as training in the following topics will be provided to all employees, whether supervisory or non-supervisory:

- environmental and personal risk factors for heat illness
- procedures for complying with the Heat Illness Prevention Standard
- the importance of frequent consumption of small quantities of water, up to four cups per hour, when the work environment is hot and employees are likely to be sweating more than usual in the performance of their duties
- the importance of acclimatization
- types of heat illness and the common signs and symptoms of heat illness
  - Heat Cramps – are painful muscle spasms that usually occur in the legs (hamstrings) and abdomen. Heat cramps are treatable, and are the least severe form of heat related illness.
  - Heat Exhaustion (heat syncope) – is an early indicator that the body’s cooling system is becoming overwhelmed. Signals of heat exhaustion include:
    - Cool, moist, pale, ashen or flushed skin
    - Headache, nausea, dizziness.
    - Weakness, exhaustion
    - Heavy sweating (a capstone sigh)
  - Heat Stroke- is a profound medical emergency. Heat stroke occurs when the body’s systems are overwhelmed by heat and stop functioning. Heat stroke is a life threatening condition and requires professional emergency medical intervention. Signals of heat stroke include:
    - Red, hot, dry skin.
    - Changes in level of consciousness
    - Vomiting
- the importance of immediately reporting to the employer, either directly or through a supervisor, signs or symptoms of heat illness in themselves and co-workers
- procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided should they become necessary and how to proceed when there are non-English-speaking workers
- procedures for contacting emergency medical services and, if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider
- procedures for ensuring that clear and precise directions to the jobsite can and will be provided as needed to emergency responders in the event of an emergency

#### 6.2 Training for Supervisors

Training in the following additional topics will be provided to all supervisors prior to assignment to supervision of employees working in the heat:





# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



- Supervisors will be trained prior to being assigned to supervise other workers. Training will include this company's written procedures and the steps supervisors will follow when employees' exhibit symptoms consistent with heat illness
- Supervisors will be trained on their responsibility to provide water, shade, cool-down rests, and access to first aid as well as the employees' right to exercise their rights under this standard without retaliation. Supervisors will be trained in appropriate first aid and/or emergency responses to different types of heat illness, and in addition, that heat illness may progress quickly from mild symptoms and signs to serious and life threatening illness.
- Supervisors will be trained on how to track the weather at the job site (by monitoring predicted temperature highs and periodically using a thermometer). Supervisors will be instructed on, how weather information will be used to modify work schedules, to increase number of water and rest breaks or cease work early if necessary.

### 6.3 Addition Training Requirements

- When the temperature is expected to exceed 80 degrees Fahrenheit, short 'tailgate' meetings will be held to review the weather report, to reinforce heat illness prevention with all workers, to provide reminders to drink water frequently, to inform them that shade can be made available upon request and to remind them to be on the lookout for signs and symptoms of heat illness.
- All employees, especially all newly hired employees, will receive heat illness prevention training prior to working outdoors.
- Both general contractors and subcontractors will ensure that all employees working outdoors are trained in heat illness prevention.
- Supervisors will be trained prior to being assigned to supervise outdoor workers.
- All workers will be assigned a "buddy" or experienced co-worker to ensure that they understood the training and follow company procedures.

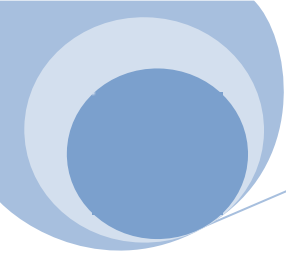
### 7.0 Hydration Techniques

For most employees who are well acclimated to exterior conditions in the work environment, proper hydration is a simple matter of drinking sufficient potable water prior to exposure to heat, and at least one quart per hour of cool potable water during the work involving exposure to high heat. Drink before you get thirsty. If you are working in high heat conditions, and become thirsty, you cannot replace the fluid loss you have sustained orally.

To re-state what Cal/OSHA recommends, an employee must consume up to four (4) cups per hour of cool, potable water during work in high heat conditions. For reference, a 500 ml bottle of commercially available water is equal to approximately two (2) cups of water. Thus, consuming two (2) 500ml bottles of water per hour would be equal to 4 cups.

Preventing heat related illness in employees is preferable to responding to a victim of heat illness. It is very important to "pre-hydrate" prior to beginning work in a high heat environment. If possible, employees should consume at least one bottle of water, or 2 cups, before beginning work in a high heat environment.

The Cal/OSHA standard requires employers to provide potable, "cool" water for employees. For reference, public drinking fountains that are not electrically refrigerated provide water at between 75 ° F and 76 ° F. If supervisors choose to supply drinking water out of insulated water coolers, the contents needs to be kept at that relative temperature. Additionally, if a water cooler is provided, it must be sanitary, and have a valve for dispensing the water into individual cups, one for each employee, or disposable cups. The use of a communal dipper is not permitted.



# ABM Technical Addendum

## CAL/OSHA Heat Illness Prevention Program



The use of **salt pills**, or **electrolyte replacement “sports” drinks** is not recommended for normal hydration and fluid replacement. Water is the preferred fluid, taken in the amounts discussed. Do not over-hydrate, or try to consume more than the recommended amount and rate. Water intoxication can occur, where so much water is ingested that electrolyte balance is disturbed, which can lead to heart arrhythmias and other circulation problems.

In summary, anticipate high heat conditions, ensure that heat illness risk factors are eliminated or controlled, pre-hydrate before beginning work in high heat and humidity, and consume at least four (4) cups of water per hour during work in high heat.

Know the signs and symptoms of heat related illness. Keep an eye on co-workers, and respond quickly when you see signs of heat related illness in others.

### 8.0 Reporting and Recordkeeping

Refer to ABM Injury and Illness Prevention program for specifics on Recordkeeping

### 9.0 References

#### Resources (include but are not limited to):

- Heat Illness Prevention Enforcement Q&A <http://www.dir.ca.gov/dosh/heatIllnessQA.html>
- Cal/OSHA’s Heat Illness Prevention etool <http://www.dir.ca.gov/dosh/etools/08-006/index.htm>
- Cal/OSHA’s Heat Illness Prevention Website <http://www.dir.ca.gov/DOSH/HeatIllnessInfo.html>

# ABM Technical Addendum

## Cold Weather Stress Safety Program



### 1.0 Purpose

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The purpose of this program is to address control measures to protect ABM employees from stress or injuries when working in cold temperatures.

### 2.0 Scope

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Each ABM worksite shall implement a site specific cold weather/cold stress hazard assessment and have the control plan approved by the ABM Safety Manager.

### 3.0 Responsibilities

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#### Safety Manager

- identify and conduct an assessment of , tasks and occupations where there is the potential for cold stress
- implement and/or provide controls (engineering, administrative or personal protective equipment) to minimize cold stress
- provide training and education regarding cold stress, including early signs and symptoms of cold-related exposure

#### Worker Responsibilities

- be familiar with the signs and symptoms of cold weather induced health problems such as hyperthermia, frostbite and trench foot.
- adhere to all control measures or work procedures that have been designed and implemented to reduce exposure to conditions that could cause cold stress
- leave cold environments if signs or symptoms of cold-related stress appear
- wear all required cold temperature clothing and PPE
- immediately report any signs or symptoms of cold-related stress

### 4.0 Cold Temperature Procedures

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#### Health Effects of Cold Stress

Warning signs of hypothermia can include complaints of nausea, fatigue, dizziness, irritability or euphoria. Workers can also experience pain in their extremities (hands, feet, ears, etc.), and severe shivering. Workers should be moved to a heated shelter and seek medical advice when appropriate.

#### Hazard Assessment

An assessment will be conducted by the Safety Manager to identify the types of jobs or employees who are at risk for cold exposure. Jobs that are at risk for cold exposure include, but are not limited to: airport ground personnel, auto repair and refueling, cold storage, construction and demolition, ice making, logging, mining, oil and gas drilling, pulp and paper, railroad and trucking, snow and trash removal, utility repair and warehousing. The assessment must also consider employees who work inside but have to go outside for any portion of the shift to either perform work or to travel to transportation departure or arrival points.

# ABM Technical Addendum

## Cold Weather Stress Safety Program



### Facilities

- Regularly used walkways and travel ways shall be sanded, salted or cleared of snow and ice as soon as practicable.
- Employees will be informed of the dangers associated with working around unstable snow and ice build-ups. All employees will be informed of the dangers and destructive potential caused by unstable snow build-up, sharp icicles, ice dams and know how to prevent incidents caused by them.
- When dangerous overhead build-ups of snow or ice are present barricades will be used to prevent staff from walking or driving into potential fall zones.

### Clothing, PPE and Supplies

Proper cold weather protection must be worn by employees when working in cold, wet and windy conditions. Protective clothing is the most important way to avoid cold stress. The type of fabric also makes a difference.

Cotton loses its insulation value when it becomes wet. Wool, silk and most synthetics, on the other hand, retain their insulation even when wet. The following are recommendations for working in cold environments:

- Wear at least three layers of clothing. An inner layer of wool, silk or synthetic to wick moisture away from the body – a middle layer of wool or synthetic to provide insulation even when hot - an outer wind and rain protection layer that allows some ventilation to prevent overheating.
- Wear a hat or hood. Up to 40% of body heat can be lost when the head is left exposed.
- Keep a change of dry clothing available in case work clothes become wet.
- With the exception of the wicking layer do not wear tight clothing. Loose clothing allows better ventilation of heat away from the body.
- Do not underestimate the wetting effects of perspiration. Oftentimes wicking and venting of the body's sweat and heat are more important than protecting from rain or snow.
- Wear insulated boots or other footwear. Felt-lined, rubber bottomed, leather-topped boots with removable felt insoles are best suited for heavy work in cold since leather is porous, allowing the boots to "breathe" and let perspiration evaporate.
- Liner socks made from polypropylene will help keep feet dry and warmer by wicking sweat away from the skin. Always wear the right thickness of socks for your boots.
- In extremely cold conditions, where face protection is used, eye protection must be separated from the nose and mouth to prevent exhaled moisture from fogging and frosting eye shields or glasses.
- Clothing must be dry. Moisture should be kept off clothes by removing snow prior to entering heated shelters.

Cold weather supplies will be regularly inspected and restocked when necessary by ABM. Regular inspections on cold weather supplies such as hand warmers, jackets, shovels, etc. will be carried out to ensure that supplies are always in stock.

### Preventative Controls That Are Implemented to Avoid Cold Induced Injuries

- Workers will be under constant protective observation by a co-worker or supervisor. ABM will implement a "Buddy System" to ensure that no employee is working alone in cold work environments.
- Some preventive measures include drinking plenty of liquids, avoiding caffeine and alcohol.
- It is easy to become dehydrated in cold weather. If possible, heavy work should be scheduled during the warmer parts of the day.

# ABM Technical Addendum

## Cold Weather Stress Safety Program



- Take breaks out of the cold.
- Try to work in pairs to keep an eye on each other and watch for signs of cold stress.
- Avoid fatigue since energy is needed to keep muscles warm.
- Take frequent breaks and consume warm, high calorie food such as pasta to maintain energy reserves.
- If a worker exposed to cold shows signs or reports symptoms of cold stress or injury the worker must be removed from further exposure and treated by an appropriate first aid attendant, if available, or a physician.
- For continuous work in temperatures below the freezing point, heated warming shelters such as tents, cabins or rest rooms should be available. The work should be paced to avoid excessive sweating. If such work is necessary, proper rest periods in a warm area should be allowed and employees should change into dry clothes.
- New employees should be given enough time to get acclimatized to cold and protective clothing before assuming a full work load.
- For work below the freezing point, metal handles and bars should be covered by thermal insulating material. Also, machines and tools should be designed so that they can be operated without having to remove mittens or gloves.

### 5.0 Training

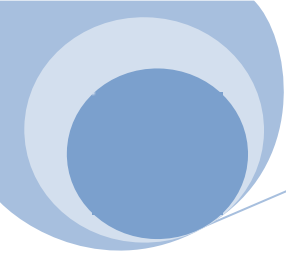
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ABM employees who are required to work in cold weather conditions will receive initial and annual training regarding the health effects of cold exposure and proper rewarming procedures, recognition of and first aid for frostbite and hypothermia, required protective clothing, proper use of warming shelters, the buddy system, maintaining communications, vehicle breakdown procedures and proper eating and drinking habits for working in the cold.

#### Health Effects

Where employees are exposed to work conditions that may present a hazard because of excessive cold ABM shall ensure that a competent person provides training to ensure the employees are familiar with the signs and symptoms of cold weather induced health problems such as hypothermia, frostbite and trench foot. Training will include:

- Hypothermia occurs when body heat is lost faster than it can be replaced. When the core body temperature drops below the normal 98.6°F to around 95°F the onset of symptoms normally begins. The person may begin to shiver and stomp their feet in order to generate heat. Workers may lose coordination, have slurred speech and fumble with items in the hand. The skin will likely be pale and cold.
- Frostbite occurs when tile skin actually freezes and loses water. In severe cases, amputation of the frostbitten area may be required. While frostbite usually occurs when the temperatures are 30°F or lower, wind chill factors can allow frostbite to occur in above freezing temperatures. Frostbite typically affects the extremities, particularly the feet and hands. The affected body part will be cold, tingling, stinging or aching followed by numbness. Skin color turns red, then purple, then white and is cold to tile touch. There may be blisters in severe cases.
- Trench Foot or immersion foot is caused by having feet immersed in cold water at temperatures above freezing for long periods of trine. It is similar to frostbite, but considered less severe. Symptoms usually consist of tingling, itching or a burning sensation. Blisters may be present.



# ABM Technical Addendum

## Cold Weather Stress Safety Program



- Workers and supervisors involved with work in cold environments should be informed about symptoms of adverse effect exposure to cold, proper clothing habits, safe work practices, physical fitness requirements for work in cold, and emergency procedures in case of cold injury. While working in cold, a buddy system should be used. Look out for one another and be alert for the symptoms of hypothermia.
- **First Aid Training**
- Employees will be trained to administer proper first aid treatment on cold induced injuries or illnesses. All ABM employees who are required to perform work in cold conditions will be knowledgeable on how to administer first aid treatment on cold induced injuries or illnesses.
- All training shall be documented.

# ABM Technical Addendum

## Hearing Conservation Program



### 1. Policy

ABM Facility Solutions will comply with all applicable federal, state and local regulations regarding occupational noise and hearing conservation. This program requires that hearing protection be provided for the employees when engineering control measures are not feasible to protect them from hazardous noise levels at or above those specified by regulations. Exposure to hazardous noise generated as a result of maintenance processes must be controlled. Hearing protection must be worn when ambient or generated noise is present.

### 2. Purpose

The program and procedures described in this document establish the requirements for management of a hearing conservation program where it is recognized that potentially hazardous noise levels exist. Engineering and administrative control measures will be implemented to protect employees from possible hearing loss and to comply with all applicable regulations and standards. Where noise levels exist which are not considered hazardous but are considered irritating by employees, actions may be taken to reduce levels based upon management discretion.

### 3. Scope

This program applies to sites where employees are exposed to occupational noise at or above action level of an 8-hour time weighted average of 85 decibels (dB) as measured on the A-weighted scale, slow response. All applicable provisions of the program will be implemented when employee noise exposures equal or exceed the action level.

### 4. Responsibilities

#### Manager

- Determines if site information is available from the customer regarding noise levels at the site
- Notifies employees of the existence of the hearing conservation program
- Informs employees of a Standard Threshold Shift
- Ensures the site hearing conservation program coordinator duties are completed

#### Site hearing conservation program coordinator

- Conducts, coordinates with the client or contracts a professional group to conduct a sound level survey of the facility as required.
- Posts warning signs that state hearing protection is required in areas that have documented noise levels at or above 85 dBA.
- Contracts a professional group to perform annual audiometric testing as required.

The program coordinator for ABM Facility Solutions may be the site manager, supervisor or designee.

#### Supervisor

- Ensures employees take the necessary precautions to meet the 14 hour minimum requirement with no exposure to excessive noise prior to audiometric testing.
- Ensures that all employees are trained on the selection, fit, use and care of hearing protection, as well as the effects of noise on hearing.
- Enforces the use of hearing protection in required areas.

# ABM Technical Addendum

## Hearing Conservation Program



### Employees

- Participate in annual hearing conservation training sessions.
- Wear hearing protection at all times in areas designated as requiring hearing protection.
- Participate, as required, in annual audiometric testing and comply with the 14 hour minimum requirement of no exposure to excessive non-occupational and occupational noise prior to audiometric testing.

### 5. Definitions

**Action level** - An 8-hour time-weighted average of 85 decibels measured on the A-scale, slow response, or equivalently, a dose of fifty percent.

**Audiogram** - A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

**Audiologist** - A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech-Language-Hearing Association or licensed by a state board of examiners.

**Baseline audiogram** - The audiogram against which future audiograms are compared.

**Criterion sound level** - A sound level of 90 decibels.

**Decibel (dB)** - Unit of measurement of sound level.

**Hertz (Hz)** - Unit of measurement of frequency, numerically equal to cycles per second.

**Noise dose** - The ratio, expressed as a percentage, of:

the time integral, over a stated time or event, of the 0.6 power of the measured SLOW exponential time-averaged, squared A-weighted sound pressure and

the product of the criterion duration (8 hours) and the 0.6 power of the squared sound pressure corresponding to the criterion sound level (90 dB).

**Time-weighted average sound level** - That sound level, which if constant over an 8-hour exposure, would result in the same noise dose as is measured.

### 6. Program Requirements

The fundamental components of an effective Hearing Conservation Program are as follows:

- Employee Exposure Monitoring
- Medical Surveillance
- Implementation of Noise Hazard Controls



# ABM Technical Addendum

## Hearing Conservation Program



- Employee Training Program
- Recordkeeping

All employees must comply with federal, state, local, and client regulations and guidelines when working in areas which have noise levels which could be considered to be potentially hazardous. Each employee is responsible for his own safety and health, the safety and health of the workers around him/her, and the protection of the environment.

### **Exposure Monitoring**

The need for monitoring will be based on data collected via comprehensive industrial hygiene surveys. Based on this information, an employee exposure monitoring strategy will be developed and implemented.

### **Medical Surveillance**

Within 6 months of an employee's exposure at or above the Action Level, as determined by employee exposure monitoring, ABM Facility Solutions shall establish a valid baseline audiogram against which subsequent audiograms can be compared. Following the baseline audiogram, annual audiograms shall be conducted on all employees participating in the Hearing Conservation Program. Employees subject to participation in the Hearing Conservation Program shall be required to wear hearing protection even prior to the date of the baseline audiogram.

At least annually after obtaining the baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 decibels. Each employee's annual audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift has occurred. If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift, the employee shall be informed of this fact in writing, within 21 days of the determination.

*Note: Employees will not be tested within 14 hours of exposure to the workplace noise they are typically exposed to. This is to ensure a proper baseline audiogram. Hearing protection may be used to meet the requirement.*

Employees shall be removed from the Hearing Conservation Program only when monitoring data has been obtained which indicates that these employees are no longer exposed to noise levels which exceed the Action Level. An employee may also be removed when changing to a job classification which is not required to participate in this program.

### **Noise Exposure Controls**

Exposure levels must be reduced to a safe level using engineering or administrative controls when possible. Where engineering or administrative controls are not economically or technically feasible to reduce employee exposures to below the 8-hour TWA PEL of 85 dBA, employees will be provided with a selection of hearing protectors. This shall be done at no cost to employees. Employees working in areas where there is equipment that produces noise levels of 85 dBA or greater shall wear adequate hearing protection, regardless of the employees' full shift exposure levels. These areas shall be designated and posted as hearing conservation areas, including a copy of the OSHA Hearing Protection standard, 29 CFR 1910.95.

# ABM Technical Addendum

## Hearing Conservation Program



Supervisors shall be responsible for ensuring that hearing protectors are readily available to, and are worn by, employees at any time when exposure to noise can be greater than 85 dBA.

If after initial review a change in threshold is detected, immediate re-evaluation of area shall be conducted. This may include re-evaluation of hearing protection required and/or re-fitting on hearing protection. In necessary medical evaluation may be required.

Employees are responsible for caring for their hearing protection and wearing their hearing protection properly and when necessary.

### **7. Training Requirements**

All employees participating in the Hearing Conservation Program will be provided training upon initial assignment and annually thereafter.

This training shall include at least the following information:

- The effects of noise on hearing,
- The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types,
- Instructions on selection, fitting, use, and care of hearing protection devices,
- The purpose of audiometric testing, and an explanation of the test procedures,
- How employee exposure levels are determined,
- How engineering and administrative controls are used to reduce noise exposures.

### **8. Recordkeeping Requirements**

Records must be maintained to show employee participation in annual Hearing Conservation Training and all medical surveillance including baseline and all subsequent audiometric testing. The Supervisor shall maintain documentation of area and personnel noise monitoring. Noise exposure monitoring records shall be retained for two (2) years, audiometric testing records shall be retained for the duration of an affected employee's employment with ABM.

### **9. References**

29 CFR 1910.95 – Occupational Noise Exposure

### **10. Attachments**

None

# ABM Technical Addendum

## Hexavalent Chromium Program



### 1. PURPOSE:

The purpose of this program outlines the requirements that ABM employees and subcontractors must comply with when implementing a program to evaluate and control worker exposure to hexavalent chromium (Cr VI).

The program provides information and the process to follow to recognize, evaluate, and control employee exposure to Cr VI at ABM,LLC project locations.

### 2. SCOPE AND APPLICATION

This program applies enterprise-wide to all ABM legal entities, their employees, subcontractors, and lower-tier subcontractors that operate in the United States.

Where states OSHA agencies may have more stringent requirements, please contact the appropriate Health and Safety Lead to address these specific requirements.

This program applies when employees may be exposed to Cr VI due to the following activities:

- ABM employees who may be exposed to Cr VI when performing hot work such as welding on stainless steel or Cr VI painted surfaces, traffic painting or paint removal containing Cr VI, refractory brick restoration, or soil disturbance activities such as drilling or from heavy equipment moving on soils containing Cr VI soils.
- ABM workers who may be exposed to Cr VI when working at project sites or in proximity to Cr VI related operations such as electroplating, painting (aerospace and autobody repair), chromate pigment and chemical production, chromium dye and catalyst production, glass manufacturing, or plastic colorant production. (ABM subcontractor, or third-party contractor employees)

**2.1 Applicable Programs-** other programs that may be applicable to worker exposure to Cr VI include the following:

- Abrasive blasting on surfaces containing Chromium VI creating airborne dispersion of Chromium VI compounds and resulting in worker exposure
- Contracts, subcontracts, and HSE management practices for subcontractor workers who perform tasks that could result in exposure to Cr VI
- Operations or tasks involving exposure to Cr VI in confined spaces
- Worker decontamination when Cr VI materials may adhere to workers' skin or clothing or to personal protective equipment worn by them
- Disposal of personal protective equipment (PPE) or other debris contaminated by chromium compounds
- Demolition where materials containing Cr VI could become airborne and present a potential worker exposure
- Exposure assessment for employee exposure to Cr VI
- Medical monitoring and access to records for employees exposed to Cr VI
- Wearing respiratory protection as a control measure to minimize employee exposure to Cr VI acceptable concentrations
- Employee training on the hazards and exposure prevention measures to Cr VI

### 3. DEFINITIONS

#### 3.1 Action Level (AL)

# ABM Technical Addendum

## Hexavalent Chromium Program



The action level for implementation of this program is a concentration of airborne Cr VI of 2.5 micrograms per cubic meter ( $2.5\mu\text{g}/\text{m}^3$ ) of air calculated as an 8-hour time-weighted average (TWA).

### 3.2 Chromium VI or Hexavalent Chrome

Chromium with a valence of positive six, in any form and in any compound.

### 3.3 Emergency Release

Any activity that results or is likely to result in an uncontrolled release of Cr VI. If an incidental release of Cr VI (measured at or below the Permissible Exposure Limit) can be controlled at the time of release by workers in the immediate release area, it is not an emergency.

### 3.4 Worker Exposure

The exposure to airborne Cr VI that would occur if the worker was not using respiratory protection.

### 3.5 High-Efficiency Particulate (HEPA) Filter

Filter that is at least 99.97 percent (%) efficient in removing mono-dispersed particles of 0.3 micrometers ( $\mu\text{g}$ ) in diameter or larger.

### 3.6 Historical Monitoring Data

Hexavalent chromium exposure assessment monitoring conducted prior to May 30, 2006, obtained during work operations conducted under workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

### 3.7 Objective Data

Information such as air monitoring data from industry-wide surveys or calculations based on the composition or chemical and physical properties of a substance demonstrating the worker exposure to Cr VI associated with a particular product or material or a specific process, operation, or activity. The data must reflect workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

### 3.8 Permissible Exposure Limit (PEL)

The level of worker exposure to an airborne concentration of Cr VI, without regard to the use of respirators, at 5 micrograms per cubic meter of air ( $5\mu\text{g}/\text{m}^3$ ) calculated as an 8-hour time-weighted average (TWA) that cannot be exceeded.

## 4. REGULATORY REFERENCES

Occupational Exposure to Hexavalent Chromium – Federal Register Number 71:10099-10385, U.S. Department of Labor, Final Rule, 29 CFR 1910.1026 and 29 CFR 1926.1126, Chromium VI  
U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), Final Rule, 29 CFR 1910.1026, and 29 CFR 1926.1126, Chromium VI

ABM provides oversight of subcontractor's activities where worker exposure to Cr VI can occur.

## 5. ROLES AND RESPONSIBILITIES

The following sections outline the roles and responsibilities for individuals when applying this program.

### 5.1 Health & Safety Leads

# ABM Technical Addendum

## Hexavalent Chromium Program



Health and Safety (H&S) Leads are responsible for assisting Project Managers in implementing this program for all projects where there is a potential for worker exposure to Cr VI. The H&S Lead has the authority to approve deviations from this standard to accommodate additional domestic and international requirements.

### 5.2 Project Manager

The ABM project manager (PM) is responsible for implementing this procedure and providing adequate resources (budget and staff) for project-specific implementation of the H&S management process on projects where there is a potential for worker exposure to Cr VI. The PM has overall H&S management responsibility, but may delegate specific tasks to other project staff. The PM retains ultimate H&S responsibility for the project.

### 5.3 Site Manager

The ABM on-site manager is responsible for all field operations onsite and is typically the Construction Manager (CM), Site Superintendent, Site Supervisor, or Field Team Leader. The Site Manager is directly responsible for implementing all aspects of the project H&S plan and applicable requirements of this program.

### 5.4 Health & Safety Manager (HSM)

The Responsible Health & Safety Manager is the HSM and is to provide health and safety technical guidance and support to the project. The HSM prepares and /or approves the ABM project H&S plan, develops the Cr VI sampling plan, conducts the personal protective equipment (PPE) evaluation for skin, eye, and respiratory hazards to Cr VI, reviews subcontractor H&S plans and submittals, conducts project H&S audits, and provides H&S support and guidance to the project.

### 5.5 Site Safety Coordinator (SSC)

The Site Safety Coordinator is either the Site Manager or is someone designated by the Site Manager to implement the project H&S plan. The Site Safety Coordinator ensures that the appropriate elements of this program are implemented.

## 6. REQUIREMENTS

The following requirements outline the mandatory criteria that each ABM employee must comply with when implementing this program using their policies, procedures, processes, training, and contracting documents.

### 6.1 Subcontractor Management

Subcontractor H&S responsibilities are expressly defined through the subcontract terms and conditions. Subcontractors must determine how to conduct their operations, in compliance with applicable H&S regulations and industry standards, and how to correct deficiencies. ABM employees shall not direct the means and methods of subcontractor operations.

Subcontractors are responsible and accountable for implementing these requirements and any additional requirements established in their own health and safety procedures as described in ABM Health & Safety Program, Contracts, Subcontracts, and HSE&Q Practices. Subcontractors retain control over their practices, and ABM oversight does not relieve them of their own responsibility for effective implementation and enforcement of H&S requirements.

### 6.2 Exposure Determination

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## Hexavalent Chromium Program



- Initial exposure monitoring must be conducted to document worker breathing-zone exposures over the course of a full shift. A representative 8-hour TWA sample shall be collected to determine employee exposure for each job classification in each work area.
- Air monitoring will be performed at the beginning of each job task.
- Exposure determinations must follow the current, accepted sampling and analytical method equivalent to that used by OSHA.
- Sample media used for Cr VI monitoring will be analyzed using an industrial hygiene laboratory accredited by the American Industrial Hygiene Association (AIHA). An equivalent laboratory accreditation can be substituted in countries that do not have an AIHA-accredited industrial hygiene laboratory.
- Periodic monitoring of workers is required at least every 6 months when the initial monitoring indicates TWA results are equal to or greater than the Action Level (AL) but below the Permissible Exposure Limit (PEL).
- When initial monitoring results are greater than the PEL, additional periodic monitoring, at least quarterly, for each worker involved is required.
- Periodic monitoring every 6 months or quarterly may be halted when two consecutive samples taken at least 7 days apart are equal to or below the AL.
- When monitoring results fall below the AL, monitoring may be suspended.
- Additional monitoring is required when there has been a change in production process, control equipment, personnel, or work practices that may result in new or additional exposures.
- A performance-oriented option may be used to determine the initial 8-hour TWA exposure for each worker on the basis of any combination of air monitoring data, historical monitoring data, or objective data sufficient to accurately characterize exposure to Cr VI.
- Workers shall be informed in writing of exposure monitoring results within 5 working days after receipt of the results.
- When the PEL has been exceeded, notification to the affected worker shall include the control measures utilized to reduce the exposure to below the PEL.

### 6.3 Demarcation of Regulated Areas

Work areas where worker exposure to Cr VI is or can reasonably be expected to exceed the OSHA PEL must be demarcated and access limited to only workers authorized to enter.

### 6.4 Methods of Compliance

Engineering and work practice controls must be applied to reduce the Cr VI worker exposure level to below the OSHA PEL unless it can be demonstrated that such controls are not feasible. Rotating employees to different jobs shall not be used to achieve compliance with the PEL. Methods of compliance in the hierarchy of controls include the following:

- Substitution – gas tungsten arc welding (GTAW) instead of shielded metal arc welding (SMAW) or flux cored arc welding (FCAW)
- Engineering controls – mechanical ventilation to remove fumes from the breathing zone
- Administrative controls – safe work practices for the worker on proper positioning to minimize fume trail in their breathing zone, either through positioning upwind in an open area or in proper alignment with ventilation controls
- Personal protective equipment (PPE) – use of respiratory protection as the last resort in reducing exposure or as an interim measure until substitution can be applied or engineering controls installed.

## Hexavalent Chromium Program

### 6.5 Respiratory Protection

Respiratory protection will be provided by the employer and worn by the worker sufficient to reduce the exposure to below the Cr VI action level. Respiratory protection will be used only as a last resort to ensure that worker exposure to Cr VI is maintained below the action level, or as an interim measure while applying substitution of materials or processes, implementation of work practice controls, or installation of mechanical ventilation. When employee exposures are above the PEL for no more than 30 days per year (12 consecutive months) from a particular process or task, respiratory protection can be primarily relied upon to ensure employee exposure is maintained below the PEL.

The elements of the respiratory protection program must comply with the ABM Respiratory Protection, and 29 CFR 1910.134, Respiratory Protection. Key elements for an appropriate respiratory protection program include the following:

- Exposure assessment to determine the appropriate respiratory protection to be selected with the required protection factor and fit factor
- Medical surveillance for workers to determine their ability to wear respiratory protection
- Fit testing of workers to identify which model and type of respiratory protection can be worn
- Training workers on how to wear, use, clean and maintain their respiratory protection equipment
- Respirator cartridge change-out guidelines for workers
- Periodic evaluation of the respiratory protection program by the assigned H&S representation

### 6.6 Personal Protective Equipment (PPE) and Work Clothing

Personal protective equipment and work clothing shall be provided to workers where an eye or skin hazard may exist to Cr VI at no cost to them. The elements of the PPE and work clothing program must comply with the ABM Personal Protective Equipment, and 29 CFR 1910.132, General Requirements for Personal Protective Equipment, and 29 CFR 1910.133, Eye and Face Protection. Key elements for an appropriate protective work clothing program include the following:

- Evaluation by the HSM of work tasks to identify the appropriate type of PPE and work clothing
- Providing the appropriate PPE and work clothing in a variety of sizes and styles
- Training workers on wearing, using, cleaning, and maintaining PPE and work clothing
- Ensuring that workers do not remove contaminated PPE or work clothing from the worksite
- Providing a service to launder reusable work clothing
- Repair or replace as needed

### 6.7 Hygiene Areas and Practices

Where work clothing is required to be worn in place of street clothing to prevent skin exposure to Cr VI, change rooms and washing facilities must be provided. Change rooms must include separate storage facilities for work clothing and for street clothes. Washing facilities must be readily accessible to workers and must be used by them at the end of the work shift and prior to eating, drinking, smoking, chewing tobacco or gum, applying cosmetics, or using the toilet.

An area on the worksite must be designated to be free of Cr VI for workers to consume food or beverages.

# ABM Technical Addendum

## Hexavalent Chromium Program



### 6.8 General Work Practices and Housekeeping

Work areas or project sites where Cr VI can potentially expose workers must implement and follow work practices to maintain acceptable housekeeping conditions to minimize contact or exposure. General work practices and housekeeping must include the following:

- All surfaces must be maintained as clean as practicable to minimize accumulation of Cr VI containing substances, dust or particles
- All spills and releases of Cr VI containing material must be cleaned up promptly
- Surfaces contaminated with Cr VI must be cleaned with HEPA-filter vacuuming or equivalent methods or practices that minimize the potential for worker exposure
- Avoid using compressed-air, dry-shoveling, dry sweeping, or dry brushing, and use only when a HEPA-filter vacuum system or equivalent method has been tried and found to be not effective
- Collection of waste, scrap, debris, or other materials contaminated or containing Cr VI must be in impermeable containers or bags and labeled meeting hazard communication requirements described in ABM Hazard Communication, or 29 CFR 1910.1200, Hazard Communication.
- Waste containing significant amounts of chromium may be subject to hazardous waste regulations and the corresponding generation, treatment and disposal requirements.

### 6.9 Medical Surveillance

Workers who are or will be potentially exposed to airborne Cr VI above the action level for at least 30 days per year, without regard to respirator use, will participate in their employer's Cr VI medical surveillance program.

Further participation in periodic Cr VI medical surveillance will be based on exposure conditions (such as an emergency or when a worker shows signs or symptoms of exposure), annually, or within a specified frequency determined by the company consulting physician (or equivalent), and at termination of employment.

Subcontractors are responsible for their workers receiving medical surveillance for Cr VI as required by regulatory requirements, contract, or their own company's requirements.

### 6.10 Communication of Hazards

Information concerning Cr VI hazards will be communicated according to the requirements of the OSHA Hazard Communications Standard and the OSHA Cr VI Standard including, but not limited to, the requirements concerning warning signs and labels, material safety data sheets (MSDSs), and employee information and training.

The entrance to regulated areas must be posted with signs that read "CHROMIUM VI REGULATED AREA – AUTHORIZED PERSONNEL ONLY".

In addition to the posting requirements, owners, contractors, and other personnel working in the area must be notified.

All storage or shipping containers shall be labeled with the following "Danger – Contains Cr VI – Cancer Hazard – Harmful if Inhaled or Swallowed – Use Only with Adequate Ventilation or Respiratory Protection".

A copy of this program and the OSHA Cr VI Standards (General Industry and Construction) will be made available to all affected project workers.



# ABM Technical Addendum

## Hexavalent Chromium Program



Additional communication requirements are described in Section 6.0 Training Requirements.

### 7. TRAINING REQUIREMENTS

Workers who may be exposed to airborne Cr VI above the action level or anticipate working on projects where they could be exposed to airborne Cr VI above the action level, or to soil that contains elevated levels of Cr VI, must complete initial Cr VI exposure training. This training covers the following information:

- Where Cr VI is typically encountered at ABM projects
- The regulatory requirements, exposure limits, potential hazards including toxicity and physical characteristics, and medical monitoring requirements
- For site-specific Cr VI hazards, discussion on the location and tasks associated with potential exposure and associated control measures
- Information contained in the site-specific Health, Safety, and Environmental Protection Plan or Job Hazard Analysis created for the project
- Quantity, location, manner of use, storage, sources of exposure, and the specific nature of operations that could result in exposure to Cr VI, as well as any necessary protective steps
- Purpose, proper use, and limitation of respirators
- Purpose and a description of the medical surveillance program
- Engineering controls and work practices associated with the employee's job assignment
- A review of this program

Each worker must be provided with a copy of the OSHA Chromium Standard (General Industry and/or Construction) and appendices if requested.

Subcontractors are responsible for complying with all applicable training requirements relating to Cr VI exposure and for providing the training necessary to complete their tasks safely.

ABM will provide initial training prior to or at each initial assignment. ABM will ensure the training is understandable and ensure each employee can demonstrate knowledge of the health hazards associated with Cr VI exposure, location, manner of use, and release of chromium in the workplace; engineering controls and work practice controls; purpose, proper selection, fitting, proper use and limitations of respirators and protective clothing; emergency procedures; measures employees can take to protect themselves from exposure; purpose and description of medical surveillance program; contents of the standard. ABM will have readily available without cost to all affected employees.

ABM will document all employee training.

### 8. RECORDKEEPING

An accurate record of all worker personal air sampling and other air monitoring related to determining Cr VI exposure for ABM employees must be completed and maintained that includes the following:

- Industrial hygiene sampling surveys
- Specific information on the sample date, worker(s) sampled, job classification, process or task sampled, materials used, PPE worn, sample duration, air sampling, and analytical method

For historical monitoring data, an accurate record of the determination must include the following information:

- Confirmation that the data was collected using acceptable sampling and analytical methods

# ABM Technical Addendum

## Hexavalent Chromium Program



- Description of the process that matches the task, conditions, materials, equipment, and process for which the exposure is being determined

For objective data, an accurate record of information that is relied upon to determine worker exposure must include the following information:

- The type of chromium-containing material
- Description of the process, activity or operation
- Other relevant information used to support a comparable exposure assessment

Exposure assessment records related to Cr VI, including worker personal air sampling, historical monitoring data, and objective data must be maintained for a minimum of thirty (30) years. Copies of exposure assessment records for ABM employees are to be forwarded to the ABM Human Resource Manager.

Medical monitoring records related to Cr VI must be maintained for each employee for thirty (30) years beyond their duration of employment. Medical monitoring records will be retained in the employee's medical file and maintained by the ABM occupational health care provider.

### Cr VI FACT SHEET

#### Uses and Occurrences

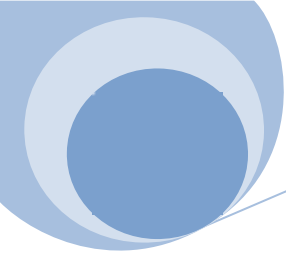
Chromium is a naturally occurring element in rocks, animals, plants, soil and volcanic gases. Chromium occurs in the environment predominantly in one of two valence states:

- Trivalent (Cr III), which occurs naturally and is an essential nutrient, and
- Hexavalent chromium (Cr VI), which, along with the less common metallic chromium (Cr 0), is most commonly produced in plating processes

The major industrial sources of Cr VI compounds are chromate pigments in dyes, paints, inks, and plastics; chromates added as anti-corrosive agents to paints, primer, and other surface coatings; chrome plating by depositing chromium metal onto an item's surface using a solution of chromic acid; particles released during smelting of ferro-chromium ore; fumes from welding stainless steel or nonferrous chromium alloys; and as an impurity in Portland cement.

#### Physical Characteristics

|                                     |  |
|-------------------------------------|--|
| Appearance:                         | Dark red flakes or powder                                  |
| Odor:                               | None   |
| Flammable:<br>combustible materials | Non-combustible, solid, but will accelerate the burning of |
| Flash Point:                        | None   |
| Flammable Range:                    | None   |
| Specific Gravity:                   | 2.7 for Cr VI  |



# ABM Technical Addendum

## Hexavalent Chromium Program



Stability: Stable  
 Incompatibilities: Reducing and oxidizing agents, acetic acid  
 Melting point: 1907°C or 3465°F for Cr  
 Boiling point: 2671°C or 4840°F for Cr

### Signs and Symptoms of Exposure

Short term (Acute): Coughing, sneezing, chest pain, breathing difficulty, itching and burning sensation to skin and lungs.  
 Long term (Chronic): Allergic (asthma like symptoms) respiratory reaction, skin and eye irritation, nosebleeds, contact dermatitis, allergic like skin reaction, ulceration and perforation of the nasal septum

### Modes of Exposure

Inhalation: Dusts and fumes  
 Skin Absorption: Liquid  
 Ingestion: Dusts and liquids

### Exposure Limits

Action level: 2.5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ )  
 PEL:  $5 \mu\text{g}/\text{m}^3$   
 STEL: None  
 TLV:  $5 \mu\text{g}/\text{m}^3$

### Exposure Level vs. Regulatory Requirements

| EXPOSURE LEVEL (EL) | REGULATORY REQUIREMENTS  |
|---------------------|--|
| EL < AL             | Maintain exposure as low as reasonably achievable  |
| AL > EL, EL < PEL   | Implement portions of the OSHA Cr VI standard and Training   |
| EL > PEL            | Implement all portions of the OSHA Cr VI Standard including training, medical surveillance, engineering controls, establishment of work areas, etc |

### PPE

Eye: Safety glasses  
 Skin: Chemical protective gloves and body protection  
 Respiratory: Air-purifying respirators and supplied-air respirators, depending on the exposure, and a PAPR if requested by the worker

### First Aid

Inhalation: Move to fresh air; seek medical attention promptly  
 Skin: Quick drenching with water; wash skin with soap and water; seek medical attention promptly  
 Eyes: Flush with water for 15 minutes, lifting the lower and upper lids occasionally; seek medical attention promptly  
 Ingestion: Seek medical attention promptly

# ABM Technical Addendum

## Benzene Awareness Guideline



This safety guideline is intended to provide suitable information to all **ABM** employees regarding the potential toxic effects of Benzene so that adequate measures can be taken to limit exposures through controls in the workplace.

### 1) *General*

Of all the hydrocarbons, Benzene poses the most serious long-term threat. Exposure over time, to even low levels of Benzene can cause leukemia, blood changes and aplastic anemia.

### 2) *Characteristics*

Benzene is a colorless to light-yellow liquid with a pleasant sweet odor.

☒☒ Formula (C<sub>6</sub>H<sub>6</sub>)

☒☒ CAS No.: 71-43-2

Benzene is a flammable liquid that can accumulate static electricity. Benzene vapors are heavier than air and may travel to a source of ignition and flash back. The vapors are readily dispersed by wind movement and/or air currents. Liquid benzene tends to float on water and may travel to a source of ignition and spread fire. Benzene is highly reactive with no oxidizing materials.

### 3) *Uses*

Benzene is a component of gasoline, both in the manufacturing process and found naturally in crude oil; Benzene is also used as a feed stock for chemical manufacturing.

### 4) *Health Effects*

#### **WARNING**

Benzene is a cancer-causing agent in humans. All contact should be reduced to the lowest possible level. The above exposure limits are for air levels only. Skin contact may also cause overexposure.

Benzene is one of the most hazardous of all petroleum products because of its adverse health hazards and high flammability.

The following adverse health effects are important to remember where there may be a potential exposure to Benzene:

a) **Acute:** At high concentrations (1000 PPM) Benzene has an acute effect on the central nervous systems causing headaches, dizziness, drowsiness, unconsciousness, and possible death.

Acute exposure can also cause breathlessness, irritability, and giddiness.

b) **Chronic:** Benzene has the chronic exposure effect on bone marrow (aplastic anemia leukemia).

# ABM Technical Addendum

## Benzene Awareness Guideline



Chronic exposure can also cause convulsions, liver damage, heart damage, blood diseases (aplastic anemia), and cancer (leukemia). These symptoms can take months or years to surface and can develop without physical or visible indications.

- c) Repeated skin contact leads to irritant contact dermatitis (rash); as with any petroleum solvent (which Benzene is also classified as), it will leach the natural oils out of the skin. Direct contact with the skin can cause erythema and/or blistering.
- d) Benzene is irritating to eyes and mucous membranes.
- e) Flammable/dangerous fire risk: benzene has a very low flash point making it dangerous to have any open flame, spark or source of ignition when vapors are present.
- f) Explosive limits in air 1.5 to 8% by volume: benzene is highly flammable at low levels of vapor quantity in air.

### **5) Personal Protective Measures**

**ABM Buiding and Energy Solutions** employees are not permitted to work in areas where there may be potential for Benzene exposure.

### **6) Training**

All employees will be provided awareness training in this program in order to be familiar with the potential hazards and proper safe work procedures to follow if exposed to this health hazard.

# ABM Technical Addendum

## Hydrogen Sulfide Awareness Guideline



This safety guideline is intended to provide suitable information to all **ABM** employees regarding the potential toxic effects of Hydrogen Sulfide (H<sub>2</sub>S) so that adequate measures can be taken to limit exposures through controls in the workplace.

### 1) *General*

Hydrogen sulfide is ever present in all refineries. In addition it is generated in many industrial processes as a by-product and also during the decomposition of organic matter containing sulfur. Hydrogen sulfide (H<sub>2</sub>S) is a colorless gas that at low concentrations has the odor of rotten eggs. At high concentrations, it kills your sense of smell.

☐☐Formula H<sub>2</sub>S

☐☐CAS No.: 7783-06-04

H<sub>2</sub>S is a highly flammable and extremely toxic gas that can form an explosive mixture with air over a wide area.

### 2) *Characteristics of Hydrogen Sulfide*

When ignition occurs, the combustion produces irritants and toxic gases, including sulfur dioxide (SO<sub>2</sub>). SO<sub>2</sub> has an irritating effect on the eyes and lungs and can be fatal at concentrations about 100PPM.

H<sub>2</sub>S is heavier than air, has a tendency to settle in low-laying areas, and is readily dispersed by wind movements or currents.

H<sub>2</sub>S attacks most metals, especially in the presence of water, forming sulfides that are usually insoluble precipitates. It is also very corrosive to plastics and tissue.

H<sub>2</sub>S dissolves in water forming a weak acid (hydro sulfurous acid).

H<sub>2</sub>S will be released when in water when agitated making it a dangerous hidden hazard.

### 3) *Health Effects*

The following information outlines the symptoms of hydrogen sulfide at specific concentrations.

10 PPM (0.001% H<sub>2</sub>S)

☐☐Obvious and unpleasant odor.

☐☐Burning eye irritation.

☐☐Permissible exposure limit is eight hours.

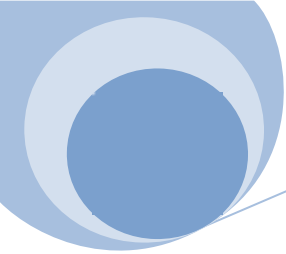
200 PPM (0.02% H<sub>2</sub>S)

☐☐Kills smell quickly.

☐☐Stings eyes and throat.

☐☐Respiratory irritation.

☐☐Death after one to two hours of exposure.



## Hydrogen Sulfide Awareness Guideline

500 PPM (0.05% H<sub>2</sub>S)

- ☒☒ Dizziness. Breathing ceases within a few minutes.
- ☒☒ Requires prompt artificial respiration.
- ☒☒ Loss of muscle control, making self-rescue impossible.

1000 PPM (0.10% H<sub>2</sub>S)

- ☒☒☒☒☒☒☒ Unconsciousness at once, followed by death within minutes.

### 4) Exposure Warning

H<sub>2</sub>S CAN PARALYZE THE SENSE OF SMELL. DO NOT USE THE SENSE OF SMELL TO DETECT H<sub>2</sub>S.

### 5) H<sub>2</sub>S Detection and Alarm Systems

In most refineries emergency employee alarms are installed to meet the regulatory standards. The alarms provide warning for the necessary emergency action according to the site emergency action plan and provide time for employees to safely escape from the workplace or the immediate area.

Systems are also used on drilling locations, offshore platforms and produce H<sub>2</sub>S, and some plants. It is not readily used on land production leases. Signs are and should be posted stating the presence of poison gas and urging caution.

### 6) Warning Conditions

There are three conditions that you must be aware of when working around H<sub>2</sub>S. The following information identifies the level of danger and alarms associated with each condition.

#### Condition Green

- ☒☒ Possible Danger
- ☒☒ No Alarms

#### Condition Yellow

- ☒☒ Moderate Danger
- ☒☒ H<sub>2</sub>S to 50 PPM
- ☒☒ Intermittent Audible Alarm and Yellow Flashing Light

#### Condition Red

- ☒☒ Extreme Danger
- ☒☒ H<sub>2</sub>S at 50 PPM or Above
- ☒☒ Continuous Audible Alarm and a Red Flashing Light

### 7) Hydrogen Sulfide Detection Devices

Fixed H<sub>2</sub>S detection devices (monitor and indicator) are designed to detect H<sub>2</sub>S concentrations in air and established TWA (time weighted average) (10 PPM) and STEL (15 PPM).



# ABM Technical Addendum

## Hydrogen Sulfide Awareness Guideline

The alarm should be capable of being perceived above the ambient noise or light levels in the affected area. The alarm should be distinctive and recognizable as a sign to evacuate the area and to start emergency status emergency procedures.

### **8) Personal Monitors**

Personal monitors are also available in many types. They are also designed with the employee's safety in mind. Familiarize yourself with the equipment available at your current work assignment.

### **9) Plant Monitors**

Plant monitors are available in many types and are designed with the employee's safety in mind. Familiarize yourself with the equipment available at your current work assignment. In order to respond effectively in an emergency situation, every individual at the site should know their specific responsibilities. Whether or not an individual has an assigned duty, each individual should know what to do in the even of an emergency.

### **10) Evacuation**

Follow these procedures in the even of a hydrogen sulfide release that requires evacuation:

- ☐☐ Hold your breath and quickly leave the area containing H<sub>2</sub>S. Do not inhale.
- ☐☐ Move quickly to the upwind "Safe Breathing Area" to receive instructions.
- ☐☐ Always be conscious of the wind and constantly monitor wind direction. Wind socks and streamers show which direction the wind is blowing so that you can determine the proper safe breathing area.

### **11) SCBA Escape**

☐☐ When in an area, on some client's premises, which has required you to be trained to use or wear an escape respirator such as an SCBA, put on your SCBA and help anyone who appears to be affected by the gas.

☐☐ Before taking off your mask, ensure that the air you will breathe is safe.

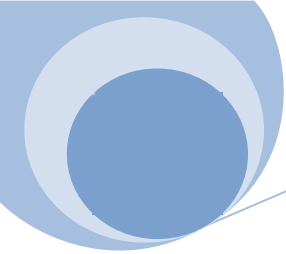
☐☐ Always be conscious of the wind and constantly monitor wind direction. Wind socks and streamers show which direction the wind is blowing so that you can determine the proper safe breathing area.

### **12) Emergency Rescue and First Aid**

To prevent risk and injury to other personnel, re-entry into an area of unknown concentration of H<sub>2</sub>S will require the use of self-contained breathing equipment and backup personnel.

- ☐☐ Wear a full rescue unit (minimum 30-minute breathing apparatus) before attempting a rescue.
- ☐☐ Remove the victim immediately to fresh air.
- ☐☐ If breathing, maintain the victim at rest and administer respiration immediately.
- ☐☐ If the victim is not breathing, start artificial respiration immediately.
- ☐☐ Call an ambulance and get the victim medical treatment.
- ☐☐ Keep the victim lying down with a blanket or coat under the shoulders to keep airway passage open. Conserve the victim's body heat and do not leave the victim unattended.
- ☐☐ If the eyes are affected by H<sub>2</sub>S, wash them thoroughly with clear water. For slight eye irritation, cold compresses are helpful.





# ABM Technical Addendum

## Hydrogen Sulfide Awareness Guideline



☒☒A victim should not return to work until authorized to do so by a physician, even if the victim has had minor exposure and has not completely lost consciousness.

### **13) PPE (Personal Protective Equipment)**

Depending on the exposure i.e., the amount of gas in the air and the type of work, employees will be required to wear different levels of PPE. Examples of protection include:

- ☒☒When the exposure level is near or above 10 PPM, you will be required to wear self contained fresh air gear.
- ☒☒Wear chemical goggles or a face shield when eye contact with this material is possible.

### **14) Ventilation (Indoor)**

Use adequate general and local exhaust ventilation to keep atmospheric vapor concentrations below the occupational exposure limits.

### **15) Eyewash and Showers**

Safety showers and eyewash stations must be available in the vicinity of a potential exposure to the material. Familiarize yourself with the location of these facilities before starting the job.

### **16) Training**

All employees will be provided awareness training in this program in order to be familiar with the potential hazards and proper safe work procedures to follow if exposed to this health hazard. The training will be provided prior to working in any job with potential exposure to H<sub>2</sub>S operations.

The purpose of hydrogen sulfide training is to familiarize employees with the provincial OHS regulations affecting H<sub>2</sub>S operations. Employees will learn the necessary skills to recognize, detect, and use the proper safety equipment in the event of an H<sub>2</sub>S incident.

# ABM Technical Addendum

## Lead Exposure & Control Procedure



### 1) Objective

To inform all ABM employees of lead exposure levels and the required controls necessary concerning exposures to lead. As well as to reduce any potential employee exposure to lead, dust or fumes that may be generated.

### 2) Policy

ABM does not want to expose its employees to any potential hazardous situation consequently we feel that it is in our best interest not to expose our employees to lead.

In such cases our local ABM Management and Corporate Safety Manager will work with our customer and their representatives to properly address the exposure and make the necessary arrangements to reduce any exposure to lead to all ABM employees at the site.

If lead is found to be present on a jobsite, ABM personnel will not disturb the lead containing materials. ABM personnel further, will not be involved in the removal / abatement of these materials.

### 3) Action Level

“Lead” means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

“Action level” is related to the employees’ exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 ug/m<sup>3</sup>) averaged over an 8-hour period.

It is at this point that specific safe guards are required to prevent a hazardous exposure to our employee.

ABM, shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 ug/m<sup>3</sup>) averaged over an 8-hour period.

If an employee is exposed to lead for more than 8 hours in any work day, the permissible exposure limit, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

*Maximum permissible limit (in ug/m<sup>3</sup>)=400 divided by hours worked in the day.*

### 4) FUNDAMENTALS OF THE PROGRAM & CONTROL MEASURES

Specific measures designed to control or eliminate employee exposure to lead will be developed as a job or task requirement’s dictate. Site specific plans will be developed with input from the customer and any appropriate specialists and experts.



# ABM Technical Addendum

## Lead Exposure & Control Procedure



### Notice

ABM Building and Energy Services will post the required warning sign in each work area where the PEL is exceeded. These signs will be illuminated and cleaned as necessary so the legend is readily visible and assure that no statement appears on or near any sign which contradicts or detracts from the meaning of the required sign. The sign will appear as follows:

WARNING  
LEAD WORK AREA  
POISON  
NO SMOKING OR EATING

Where our employee jobsite is not under the control of the ABM, we will work with our customers and their representative to assure these required signs are properly posted.

### Lead Removal Activities

It is our policy to decline participation in lead removal activities.

### Monitoring

ABM shall collect full shift (for at least 7 continuous hours) personal samples including at least one sample for each shift for each job classification in each work area.

Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

Initial determination: If our local customer has a workplace or work operation covered by the OSHA Standard for lead CFR 1910.1025, ABM shall determine if any our employees' may be exposed to lead at or above the action level.

### Basis of initial determination

ABM in conjunction with other information from our customer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any of the following, relevant considerations:

Any information, observations, or calculations which would indicate employee exposure to lead;

Any previous measurements or information available to us from our customer of airborne lead; and

Any employee complaint's of symptoms' that may be attributable to exposure to lead.

Monitoring for the initial determination may be limited to a representative sample of the exposed employees who we may reasonably believe is exposed to the greatest airborne concentrations of lead in the workplace. (Measurements of airborne lead made in the preceding 12 months may be used to satisfy the requirement to monitor).

# ABM Technical Addendum

## Lead Exposure & Control Procedure



### Tasks Producing Exposures between 500MG/M3 TO 2500 MG/M3

- Using lead containing mortar: Typically used in high pressure acid tanks lined with specialized tile or lead brick held in place with specialized lead-containing mortar or grout: these tanks linings periodically require repainting, repairing, or relining involving lead containing mortar.
- Lead burning: Involves torch melting or fusing of led or alloyed lead to another lead object.
- Rivet busting: Involves removal of rivets from steel structures where lead containing paints are present; rivet busting can include use of torches and mechanical means for rivet extraction.
- Power tool cleaning without dust collection systems: Involves the use of power tools (grinders, brushes, needle guns, sanders, etc.) to remove dirt, scale, or paint from structures where lead based paint is present.

### Tasks Producing Exposures Greater than 2500MG/M3 (50 TIMES THE PEL)

- Abrasive blasting: Removes scale, paint, and dirt from surfaces prior to repainting; abrasive media includes sand, steel grit, steel shot, aluminum oxide, "Black Beauty" (processed boiler slag and others).
- Welding, cutting and torch burning on steel structures: Involves the process of heating coated steel to its melt temperature typically by using an oxyacetylene torch or an arc welder.

### Positive initial determination and initial monitoring

Where a determination shows the possibility of any employee exposure at or above the action level, the local ABM Management shall conduct monitoring which is representative of the exposure for each employee in the workplace who is exposed to lead.

### Negative initial determination

Where a determination is made that no employee is exposed to airborne concentrations of lead at or above the action level, the local ABM Management shall make a written record of such determination. The record shall include at least the methods used to determine the levels, what the results were, the date of the determination, the location within the work-site and the name and social security numbers of the employees monitored.

### Frequency

If the initial monitoring reveals employee exposure to be below the action level the measurements need not be repeated.

If the initial determination or subsequent monitoring reveals employee exposure to be at or above the action level but below the permissible exposure limit, ABM shall repeat monitoring at least every 6 months. We will continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time we will discontinue monitoring for that employee.

If the initial monitoring reveals that employee exposure is above the permissible exposure limit, ABM shall repeat monitoring quarterly. ABM shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the PEL but are at or above the action level. At that, ABM Building and Energy Services shall repeat monitoring for that employee every 6 months.

# ABM Technical Addendum

## Lead Exposure & Control Procedure



### ***Employee notification***

Within 5 working days after the receipt of monitoring results, ABM shall notify each employee in writing of the result's that represent that employee's exposure.

Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the permissible exposure limit, ABM shall include in a written notice, a statement that the permissible exposure limit was exceeded and a description of the corrective action taken or to be taken to reduce exposure to or below the permissible exposure limit.

### ***Accuracy of measurement***

ABM shall hire the services of a qualified professional that will use a method of monitoring and analysis which has an accuracy (to a confidence level of 95%) of not less than plus or minus 20 percent for airborne concentrations of lead equal to or greater than 30 ug /m (3).

### ***Methods of compliance***

Engineering and work practice controls.

Where an ABM employee is exposed to lead above the permissible exposure limit for more than 30 days per year, ABM along with our customer shall implement engineering and work practice controls (including administrative controls) to reduce and maintain employee exposure to lead.

If engineering and work practice controls are instituted and are not sufficient to reduce employee exposure to or below the permissible exposure limit, ABM will use them to reduce exposures to the lowest feasible level and shall supplement them by the use of respiratory.

If an employee is exposed to lead above the permissible exposure limit, for 30 days or less per year, ABM along with our customer shall implement engineering controls to reduce exposures to 200 ug/m(3). Thereafter ABM may implement any combination of engineering, work practice (including administrative controls), and respiratory controls to reduce and maintain employee exposure to lead to or below 50 ug/m (3)

### ***Respiratory protection***

Where engineering and work practice controls do not reduce employee exposure to or below the 50 ug/m (3) permissible exposure limit, ABM shall supplement these controls with respirators.

### ***Compliance program***

ABM shall establish and implement a site specific written compliance program in conjunction with our customer to reduce exposures to or below the permissible exposure limit and interim levels if applicable, solely by means of engineering and work practice controls.

Written plans for these compliance programs shall include at least the following:

- A description of each operation in which lead is emitted; e.g. machinery used, material processed, controls in place, number of employees, employee job responsibilities, operating procedures and maintenance practices;
- A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to lead;
- A report of the technology considered in meeting the permissible exposure limit;

# ABM Technical Addendum

## Lead Exposure & Control Procedure



- Air monitoring data which documents the source of lead emissions;
- A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;

The written programs shall be revised and updated at least every 6 months to reflect the current status of the program.

### **Mechanical ventilation**

When ventilation is used to control exposure, measurements that demonstrate the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure shall be made at least every 3 months. Measurements of the system's effectiveness in controlling exposure shall be made within 5 days of any change in production, process, or control that might result in a change in employee exposure to lead.

If air from exhaust ventilation is re-circulated into the workplace, the customer shall assure that:

The system has a high efficiency filter with reliable back-up filter;  
Controls to monitor the concentration of lead in the return air and to bypass the re-circulation system automatically if it fails are installed, operating, and maintained.

### **Administrative controls**

If administrative controls are used as a means of ABM employees' TWA exposure to lead, the local management shall establish and implement a job rotation schedule, which includes:

Name or identification number of each affected employee;

Duration and exposure levels at each job or work station where each affected employee is located; and

Any other information that may be useful in assessing the reliability of administrative control's to reduce exposure to lead.

### **Respiratory protection**

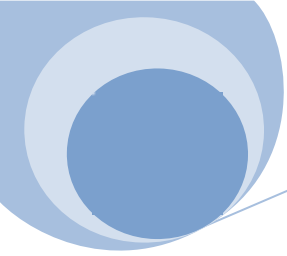
If an employee has breathing difficulty during fit testing or respirator use, ABM will provide the employee with a medical examination to determine whether or not the employee can use a respirator while performing the required duty.

### **Respirator selection**

Respirators shall be used whenever the concentration of airborne lead is at or above the PEL; in work situations in which engineering and work practice controls are not sufficient to reduce exposures to or below the PEL, whenever an employee request's a respirator. Also as interim protection for employees performing tasks in which an initial exposure assessment has not been conducted.

The selection of respiratory protection for lead will be based on the results of the initial exposure assessment. After the initial exposure assessment, respirators will be selected according to Table II of the Respiratory Protection section of the standard (Sec. 1910.1025(f)). As a minimum, half face air purifying respirators with high efficiency filters will be available for all workers. Upgrading of respiratory protection will be anticipated whenever work practices change.

A quantitative or qualitative fit test will be provided at the time of initial fitting and at least every six months thereafter when a negative pressure respirator is used.



# ABM Technical Addendum

## Lead Exposure & Control Procedure



When the employee exhibits difficulty in breathing during the fitting and testing, or during use, the employee will not be permitted to use the respirator until the medical consultant examines and test the individual and certifies that the individual is fit to wear a respirator while performing the required duties.

Respirator filter elements will be changed daily or whenever an increase in breathing resistance is detected.

Employees wearing respirators will be permitted to leave the work areas to wash their face and respirator face-pieces whatever necessary to prevent skin irritation associated with respirator usage. Respirator face-pieces will be assigned to each individual required to wear a respirator. Respirator face-pieces will not be shared. When practical, a disposable low maintenance, NIOSH approved half face respirator will be used. Goggles will be provided to users of half face respirators.

Training in the care, use, and limitations of respirators will be provided to all individuals who are required to wear a respirator.

### **Protective work clothing and equipment**

#### ***Provision and use***

If an employee is exposed to lead above the PEL, or where the possibility of skin or eye irritation exists, ABM shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

- Coveralls or similar full-body work clothing;
- Gloves, hats, and shoes or disposable shoe coverlets; and
- Face shields, vented goggles, or other appropriate protective equipment.

#### ***Cleaning and replacement***

ABM shall provide the protective clothing required in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 ug/m<sup>3</sup> of lead as an 8-hour TWA.

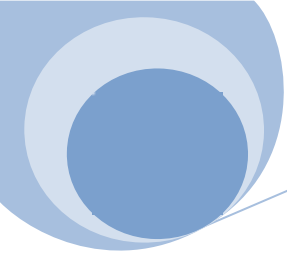
Local ABM Management shall provide for the cleaning, laundering, or disposal of protective clothing and equipment.

ABM shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness. All protective clothing must be removed at the completion of a work shift only in change rooms provided for that purpose.

ABM is responsible for making sure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change-room which prevents dispersion of lead outside the container.

ABM shall inform in writing any person or company who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

All containers with protective clothing and equipment will be labeled as follows:



# ABM Technical Addendum

## Lead Exposure & Control Procedure



CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.

### **Housekeeping**

#### ***Surfaces***

All surfaces shall be maintained as free as practicable of accumulations of lead.

#### Cleaning floors

Floors and other surfaces where lead accumulates may not be cleaned by the use of compressed air.

Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.

Where vacuuming methods are selected, the vacuums shall be used and emptied in a manner that minimizes the reentry of lead into the workplace.

#### ***Change rooms***

ABM and our customer shall provide clean change rooms for employees who work in areas where their airborne exposure to lead is above the PEL. Local ABM Management shall assure that change rooms are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.

#### ***Showers***

ABM shall assure that employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators, shower at the end of the work shift.

After showering the ABM employee may not leave the workplace wearing clothing or equipment worn during the work shift.

#### ***Lunchrooms***

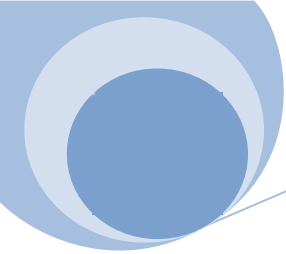
ABM shall provide lunchroom facilities for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.

The lunchroom facilities must have a temperature controlled, positive pressure, filtered air supply, and must be readily accessible to employees.

It is mandatory that employees who work in areas where their airborne exposure to lead is above the PEL without regard to the use of a respirator wash their hands and face prior to eating, drinking, smoking or applying cosmetics.

Employees are strictly prohibited entering lunchroom facilities with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, down draft booth, or other cleaning method.





# ABM Technical Addendum

## Lead Exposure & Control Procedure



### **Medical surveillance**

#### **General**

Local ABM management will institute a medical surveillance program for all employees who are or may be exposed above the action level for more than 30 days per year.

The surveillance program shall be conducted or performed by or under the supervision of a licensed physician.

#### **Biological monitoring –**

Blood lead and ZPP level sampling and analysis.

At least every 6 months local ABM Management shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee exposed.

At least every two months for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 ug/100 g of whole blood. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 ug/100 g of whole blood; and

At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.

#### **Follow-up blood sampling tests.**

Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal the ABM Management shall provide a second (follow-up) blood sampling test. The test shall be administered within two weeks after the employer receives the results of the first blood sampling test.

#### **Employee notification**

Within five working days after the receipt of biological monitoring results, local ABM management shall notify in writing each employee whose blood lead level exceeds 40 ug/100 g.

#### **Multiple physician review mechanism**

The employee may chose to have a second physician review any findings, determinations or recommendations of the first physician after the initial physician chosen by ABM conducts the medical examination.

If the findings, determinations or recommendations of the second physician differ from those of the initial physician, then local ABM management and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

If the two physicians have been unable to quickly resolve their disagreement, then local Affiliated Building Services Inc., management and the employee through their respective physicians shall designate a third physician.

ABM shall provide an initial physician conducting a medical examination as well as any subsequent physicians with the following information:

# ABM Technical Addendum

## Lead Exposure & Control Procedure



- An entire copy of this procedure.
- A description of the affected employee's duties as they relate to the employee's exposure;
- The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);
- A description of any personal protective equipment used or to be used;
- Prior blood lead determinations; and
- All prior written medical opinion's concerning the employee in the employer's possession or control.

### **Written medical opinions**

ABM shall obtain and furnish the employee with a copy of all written medical opinions from each examining or consulting physician concerning the work related exposures.

ABM will not reveal either in the written opinion, or in any other means of communication obtained from the physician any findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead.

Advise the employee of any medical condition, occupational or non-occupational, which dictates further medical examination or treatment.

ABM will remove any employee from exposure to lead, provide special protective measures for the employee, or place limitations upon the employee consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee health status. We will maintain the total normal earnings, and other employment rights and benefits of the employee, including the employee's right to his or her former job status as though the employee had not been medically removed or otherwise medically limited.

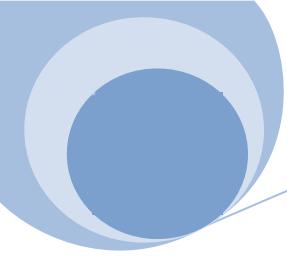
Medical removal protection will be implemented under the following conditions:

- Exposure to lead, at or above the action level, on each occasion that a periodic and follow up blood sampling test conducted indicates that the employee's blood lead level is at or above 50 ug/100 g of whole blood.
- On each occasion that a final medical finding, determination, or opinion that the employee has a detected medical condition which places the individual at increased risk of material impairment to health from exposure to lead.
- A final medical determination result's in any recommended special protective measures for an individual or limitations on an individual exposed to lead.

The medical consultant will determine when a removed employee s eligible to return to his former job.

### **Temporary removal due to a final medical determination**

ABM local management will remove an employee from work having an exposure to lead at or above the action level. The employee will be removed after a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.



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## Lead Exposure & Control Procedure



Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, local ABM management shall implement and act consistent with the recommendation.

### **Return of the employee to former job status**

ABM shall return an employee to his or her former job status. For an employee removed due to:

- A blood lead level at or above 60 ug/100 g, or
- Due to an average blood lead level at or above 50 ug/100 g, or

When two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 40 ug/100 g of whole blood.

### **V. Training Requirements**

Training is required for each employee that is subject to a potential exposure or lead at or above the action level on any day or who are subject to exposure to arsenate, lead azide or other similar lead compounds that may cause skin or eye irritation. This training is required prior to job assignment. This training must be documented and kept on file at the ABM office.

Retraining is required on an annual basis and in at least the following situations:

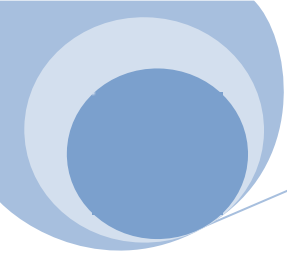
1. Where changes at the worksite present a hazard about which an employee has not been previously trained;
2. Where changes in the specific nature of the operations could result in exposure to lead above the action level;
3. Where inadequacies in an affected employee's work indicate that the employee has not retained the required proficiency.

Employee training will include but is not limited to:

1. The policy and purpose for the Program;
2. Information regarding the specific nature of the operations which could result in an exposure to lead;
3. Hazard identification;
4. All required control measures as outlined in this program to include;

### **Effects of lead poisoning on employees and their families**

There are many different health effects associated with elevated blood lead levels. Young children under the age of six are especially vulnerable to lead's harmful health effects, because their brains and central nervous system are still being formed. For them, even very low levels of exposure can result in reduced IQ, learning disabilities, attention deficit disorders, behavioral problems, stunted growth, impaired hearing, and kidney damage. At high levels of exposure, a child may become mentally retarded, fall into a coma, and even die from lead poisoning. Within the last ten years, children have died from lead poisoning in New Hampshire and in Alabama. Lead poisoning has also been associated with juvenile delinquency and criminal behavior.



# ABM Technical Addendum

## Lead Exposure & Control Procedure



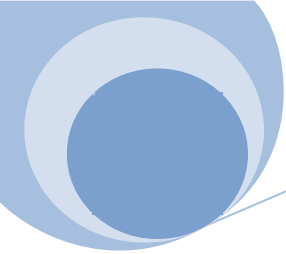
In adults, lead can increase blood pressure and cause fertility problems, nerve disorders, muscle and joint pain, irritability, and memory or concentration problems. It takes a significantly greater level of exposure to lead for adults than it does for kids to sustain adverse health effects. Most adults who are lead poisoned get exposed to lead at work. Occupations related to house painting, welding, renovation and remodeling activities, smelters, firing ranges, the manufacture and disposal of car batteries, and the maintenance and repair of bridges and water towers, are particularly at risk for lead exposure. Workers in these occupations must also take care not to leave their work site with potentially contaminated clothing, tools, and facial hair, or with unwashed hands. Otherwise, they can spread the lead to their family vehicles and ultimately to other family members.

When a pregnant woman has an elevated blood lead level, that lead can easily be transferred to the fetus, as lead crosses the placenta. In fact, pregnancy itself can cause lead to be released from the bone, where lead is stored—often for decades—after it first enters the blood stream. (The same process can occur with the onset of menopause.) Once the lead is released from the mother's bones, it re-enters the blood stream and can end up in the fetus. In other words, if a woman had been exposed to enough lead as a child for some of the lead to have been stored in her bones, the mere fact of pregnancy can trigger the release of that lead and can cause the fetus to be exposed. In such cases, the baby is born with an elevated blood lead level.

### **VI. Multi-employer worksites**

In the event an ABM employee is actively working on a jobsite at which another contractor or contractors are in the process of lead abatement:

- ABM employees will not be allowed to perform work within two hundred (200) feet of any active abatement area.
- ABM employees will be removed from the site if any issues arise with abatement containment and will not be allowed to return until full air monitoring by the abatement contractor and or project owner proves the area has been cleared.



# ABM Technical Addendum Lead Exposure & Control Procedure



## Sample Asbestos Work Permit

Form # A-100 (Application Form for maintenance work approval)

### Job Request Form for Maintenance Work

Name \_\_\_\_\_, Dept \_\_\_\_\_

Telephone No \_\_\_\_\_, Job Request No \_\_\_\_\_

Requested starting date \_\_\_\_\_, Anticipated finish date \_\_\_\_\_

Address, building, and area location (or description of work area, well, etc. to be permitted)

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### Assignment/Task

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Identification of any special working methods, equipment, etc. to be used (if known) (check box for asbestos)

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Name and telephone number of reporter:

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Name and telephone number of supervisor:

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Submit this application to:

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(Site Asbestos Program Manager)

**NOTE:** This application must be completed by the person who will be performing the work. It must be submitted to the Asbestos Program Manager for approval. It is not valid until approved.

\_\_\_\_\_  
Signature of Reporter  
\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Supervisor

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# ABM Technical Addendum

## Ladder Safety Program



### 1. Purpose

This Policy establishes the requirements to be followed to prevent injury from improper use of ladders by Company personnel.

### 2. Scope

This policy and procedure applies to all "Company" facilities, projects and employees except where superseded by more stringent local standards or client requirements.

### 3. General

Ladders are used for many purposes. This policy outlines the procedure, terminology, responsibilities, and reviews basic principles to ensure safety and efficiency when using ladders.

### 4. Definitions

**Extension (trestle) ladder** - a portable ladder that is adjustable in length and has a suitable means for locking the ladder sections together.

**Job-built ladder** - a ladder that is fabricated at the facility and not manufactured.

**Stepladder** - a self-supporting, foldable ladder that is not adjustable in length.

**Straight ladder** - a non-adjustable ladder.

### 5. Procedure

#### General Rules

General Rules to be followed when using ladders:

- Defective or damaged ladders will not be used. Before each use, ladders will be inspected for the following prior to use:
  - Missing non-skid feet
  - Worn or frayed ropes
  - Cracks in sides or rungs
  - Missing rivets or other fasteners
  - Bent or missing spreaders
  - Bowed or distorted members
  - Loose rungs
  - Any condition that could cause a safety problem
  - All Ladders must meet OSHA/ANSI specifications
- **Only Type 1A Fiberglass ladders shall be used**
- Ladders will not be painted, as paint can hide damage to the ladder and defects in the materials of construction.
- The correct type of ladder will be selected for the job. Only type 1A non-conductive ladders will be used for work involving electricity or the use of electrically powered tools.
- Extension ladders will be secured by tying the top or bottom rung to a fixed structure that will support more than the anticipated total load of the ladder.

# ABM Technical Addendum

## Ladder Safety Program



- Lean a straight or extension ladder against a wall or similar object that can support both of the ladder's side rails. Do not rest the top of the ladder on the rung.
- Ensure that an adequate slope is maintained where the base of the ladder is placed at least 1/4 the length of the ladder away from the supporting structure.
- The feet of the ladder will be placed securely on the ground or work floor and not on other objects in an attempt to extend the reach of a ladder.
- Ladders will not be lengthened by splicing additional sections to the ladder.
- Always face a ladder while ascending or descending it.
- Ladders will be positioned so that work can be performed without leaning and will be moved as work progresses.
- Ladders will not be placed near power lines or against movable objects or vehicles.
- Ladders will not be placed in front of doors that open toward the ladder unless the door is locked in the open position, locked shut or guarded by another employee. If the door is locked shut because of ladder work, post the locked door with a “DO NOT OPEN—WORK IN PROGRESS” (or similar sign).
- Unattended step or straight ladders will not be left standing but should be closed, lowered to the ground and placed where they do not present tripping hazards.
- The area around the base and top of the ladder will be kept free of tripping hazards and barricaded if the base or top projects into a passageway.
- Ensure that shoes are free of mud, oil or grease before ascending or descending a ladder. Ladder rungs will be cleaned immediately if they become soiled to reduce slipping hazards.
- Workers will use a tool pouch or raise or lower materials using a line or line and bucket rather than carrying them while ascending or descending a ladder.
- Only one employee will work from a ladder at a time so that the design load capacity of the ladder is not exceeded.
- Ladders shall be selected for the correct load capacity to fit the task to be performed.
- Every excavation, bell hole or trench that is more than 4 feet deep will have a ladder (or ladders) that extend at least 3 feet above the ground surface that is placed so that personnel will not travel more than 25 feet to get to a ladder.
- Ladders shall only be used for their intended purpose.

### Stepladders

Stepladders that wobble will be removed from use, marked “DO NOT USE—DEFECTIVE” (or similar sign) and repaired (if possible) or replaced. The following precautions will be taken when using stepladders:

- Spreaders will be fully opened and locked before using the ladder.
- The top step of a stepladder will never be used. Rather, use a longer stepladder, a longer straight ladder or another method of reaching the work.
- Tools or materials will not be left on the top shelf of a stepladder but will be removed before descending a ladder and/or moving it.

# ABM Technical Addendum

## Ladder Safety Program



- Tools will not be left on the top step of a ladder - put the tool back in the tool pouch

### Straight Ladders/Extension Ladders

Straight Ladders will be leaned against the structure being climbed so that the distance from the ladder's feet to the base of the structure is one-fourth ( $1/4$ ) the distance along the ladder's length to its upper contact point with the structure in order to assure a safe slope. **Easy Method:** Count the ladder rungs from the feet to the point of contact and divide by four (4)—the feet of the ladder should be that many feet from the structure base. In addition, the following precautions will be taken when using straight ladders:

- At least three (3) feet of ladder should extend above the upper point of contact with the structure being climbed.
- Lean a straight or extension ladder against a wall or other straight, even, fixed object. Never lean a ladder against a narrow column, pole or other surface that cannot support both of the ladder's side rails.
- Use a ladder that is the length needed. Never work from the top two rungs of a straight ladder.
- When either the length or the weight of a ladder, make it difficult to handle, two people will raise and secure the ladder. One should secure the feet while the other walks under the ladder from the opposite end until it is raised enough to place or move. Raise the extension, if needed. Reverse the process for lowering the ladder.
- When the ladder extends more than 4 feet above the top tie-off, a barrier or flag will be placed on the ladder to prevent personnel from climbing beyond a safe point.
- Extension Ladders will be equipped with necessary irons, locks and hooks and will be assembled so the sliding (upper) section is on top of the base (lower) section.

### Storing Ladders

When storing ladders, take the following precautions:

- Support ladders stored or hung horizontally in a sufficient number of places to prevent sagging and permanent set.
- Tie together or otherwise secure ladders that are stored vertically to keep them from falling into aisles or equipment.
- Ladders will be cleaned after every use before being returned to storage. All mud, oil and grease will be removed.

### Fixed Ladders

Fixed Ladders more than 20 feet high will be caged unless other fall prevention safety devices are installed and used. Fixed ladders with cages exceeding 20 feet in height will have landing platforms installed every 30 feet. Fixed ladders should be securely attached to an immovable structure and attachments will be inspected annually for signs of deterioration or detachment. Repairs will be made immediately.

### Securing Ladders while in use

All ladders that are not self-supporting will have an adequate tie-off rope securely attached to the top section of the ladder and to the fixed structure at all times. Have a co-worker hold the ladder in place when the ladder cannot be tied off at the top, when the feet are on a slanting or slippery surface or when the ladder feet cannot be placed between  $1/4$  and  $1/3$  of the length away from the structure.



### **Inspections**

Ladders will be kept in good condition at all times and will be inspected before each use. Regular inspections help ensure that ladders are safe to use. Ladders found to have defects will be removed from service for repair or destruction and tagged or marked “Danger—Do Not Use”. The quarterly safety inspection will be recorded and documented by the Maintenance Supervisor.

### **6. Training**

All employees using ladders will be trained in safe ladder use. Verification of training will be entered into the employees training record for proof of training and retention.

### **7. Recordkeeping**

Training Records will be retained for the duration of employment plus 3 years. If site demobilizes, training records will be shipped to the corporate office for retention.

### **8. References**

#### **Additional Information Sources**

- American National Standards Institute, A14, Standard for Ladders

#### **Regulatory References**

- 29 CFR 1910.25, Portable Wood Ladders.
- 29 CFR 1910.26, Portable Metal Ladders.
- 29 CFR 1910.27, Fixed Ladders.
- 29 CFR 1926.1053, Ladders.

# ABM Technical Addendum

## Hot Work Program



### 1. Policy

It is ABM policy that only fully trained and authorized employees shall be permitted to perform operations involving hot work. Employees required to perform hot work as part of their normal work duties shall be trained to recognize associated hazards and follow safe work procedures.

### 2. Purpose

The purpose of this program is to establish requirements for ABM personnel or contractors performing hot work involving the use of an electrical arc, open flame, or any other means capable of producing temperatures that may cause fires or health hazards.

### 3. Scope

This procedure applies to all ABM personnel and contractors tasked with performing hot work operations during building maintenance, equipment installation and renovation and construction activities.

### 4. Responsibilities

#### Manager and/or Supervisor

- Shall not authorize any hot work operations without full knowledge of all regulations and responsibilities,
- Ensure employees who supervise and/or are involved in hot work operations are:
  - Trained,
  - Follow safe operating procedures to protect themselves and others from fire, explosion, and harmful exposure to fumes, gases and noise resulting from hot work operations, and
  - Wear appropriate personal protective equipment.
- Ensure employees who are involved in the use or management of oxygen or fuel gas supply equipment, including any distribution, are competent in performing this function.
- Ensure that all welding equipment, including gas cylinders, is correctly stored in accordance with regulations.

#### Employees

- Engage in hot work operations only if fully trained to perform such duties, including the full understanding of all relevant regulations.
  - Training to perform welding operations shall be composed of a minimum of 8 hours and/or comprised of an employee technical/safety competency review.
  - All training documentation must be kept on file at the branch/facility offices.
- Follow safe operating procedures. If it cannot be conducted safely, hot work operations shall not be performed at the location.
- Ensure that all appropriate hazard reduction measures are in place.
- Use all precautions to prevent injury to themselves or others, or damage to property.
- Properly use and maintain appropriate personal protective equipment.
- Report any unsafe acts, equipment defect or safety hazards and discontinue use of equipment until its safety has been assured. Repairs shall be made only by qualified personnel.
- Obtain a permit before beginning any hot work.

#### Hot Work Authorizer

- Follow safe operating procedures.
- Complete required training activities.

## Hot Work Program

- Report unsafe acts and conditions.
- Evaluate the need for hot work, inspect the area and designate the safety precautions to be taken.
- Confirm that a trained Fire Watch has been appointed and that those performing hot work operations are taking the precautions outlined in this procedure and on the hot work permit.
- Authorize the work to proceed by issuing a hot work permit.

### **Fire Watch**

- Follow safe operating procedures,
- Complete required training.
- Report unsafe acts and conditions; activate the fire alarm in event of a fire.
- Provide appropriate fire extinguishing equipment, to include fire extinguishers and fire blankets.
- Monitor the area before, during and after hot work as specified on the hot work permit.

### **5. Definitions**

**Designated Area:** A designated area is a specific area designed or approved for hot work, such as a maintenance shop or a detached outside location that is of noncombustible or fire-resistive construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas.

**Fire Watch:** A person trained in the proper use of fire extinguishing equipment and whose task during hot work operations is to provide proper fire extinguishing equipment and constantly observe the area for signs of fire and other safety concerns.

**Hot Work:** Any operation that involves the use of an open flame, an electrical arc, or equipment capable of producing sparks or flames. Welding, cutting, grinding, pipe sweating, and other hot work often requires using open flames or applying temperatures sufficiently hot to start fires.

**Hot Work Authorizer:** An employee or contractor designated by the ABM manager or supervisor who has successfully completed training in hot work procedure and safety precautions. Examples of employees or contractors that may act as Hot Work Authorizers are Managers or Supervisors.

**Hot Work Permit:** The hot work permit is used to document the precautions, scope and duration of the hot work activity, and to identify the person performing the hot work and the Hot Work Authorizer. A hot work permit must be issued prior to the start of any hot work unless the area is specifically designated for hot work. A hot work permit is valid only for a single job at a single location. At no time shall a hot work permit be valid for more than one shift or when the employee or contractor acting as the Hot Work Authorizer changes.

**LEL/LFL:** Lower Explosive Limit/Lower Flammability Limit. Both refer to the lowest concentration of gas or vapor (% by volume in air) that burns or explodes if an ignition source is present.

**Welder:** The welder is an employee or contractor who is performing the hot work. In situations where welding is being conducted on structural members, load-bearing platforms, pressure vessels, or other objects that would present a life/safety issue should the weld fail, the welder must have the appropriate certifications to conduct the work.

## 6. Program Requirements

### 6.1 General Requirements

- Any designated area where employees may perform hot work must be properly evaluated and identified.
- All hot work operations must be evaluated for hazards, and controls must be implemented to minimize and control those hazards. Hazards may include harmful exposure to fumes, gases, radiation, and noise. Other hazards include fire and explosion.
- Hot work is prohibited in unauthorized areas, in areas while sprinkler systems are impaired, where hazardous atmospheres exist, near flammable or combustible materials, and/or in confined spaces unless approved by the site manager, supervisor or safety administrator.
- All compressed gas cylinders must be moved and stored in an upright and secured position.
- Oxygen and fuel gas cylinders should be segregated and stored at least 20 feet apart or separated by a noncombustible wall at least 5 feet high with the protective valve caps in place except when in use.

### 6.2 Safe Work Practices

#### a. Safe work practices for hot work operations include:

- Obtaining an authorized hot work permit from and signed by the hot work authorizer following an inspection.
- Posting the hot work permit at the worksite while work is being performed.
- Working safely with compressed gas cylinders.
- Ensuring necessary guards are in place.
- Ensuring the workplace is free of clutter.
- Ensuring flammable and combustible materials are moved at least 35 feet away from the work area; if relocation is impractical, combustibles must be protected by a listed or approved welding curtain, welding blanket, welding pad, or equivalent.
- Keep combustible floors wet, cover with sand, or protected with metal or non-combustible insulating blankets.
- If working overhead, section off a 15-foot area to protect passers-by.
- Keeping suitable fire extinguishing equipment readily available.
- Ensuring fire watchers are trained to use fire extinguishing equipment and activate the fire alarm in event of a fire, and are made available for a minimum of 30 minutes after the hot work operation is completed.
- Correctly wearing personal protective equipment.
- Ensuring adequate ventilation is provided.
- Ensuring the first aid supplies are available.

#### b. Hot work equipment must:

- Be maintained in good operating conditions at all times with all required guard in place.
- Be inspected prior to each use.
- Have damaged hoses and electrical cables replaced, not taped, before use.
- Have all parts specifically designated for the assigned task.
- Be equipped with combination flashback/backflow protection devices on the fuel hose at the torch and oxygen for oxy-fuel gas systems.
- Must be used and stored to prevent damage to the equipment and surrounding equipment and facilities.
- Be removed from service if defective, tagged, replaced or repaired, and re-inspected before being placed

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## Hot Work Program



back in service.

### c. Hot work is not permitted:

- Without a hot work permit.
- When fire suppression systems are impaired.
- In the presence of flammable liquids, vapors, gases, dust, or lint.
- On improperly prepared drums, tanks, or other containers which have contained flammable materials.
- On metal partitions, walls, ceiling or roofs which have combustible covering or are constructed of combustible materials.
- On equipment which has a combustible lining.
- On pipes or other metals in contact with combustible walls, partitions, ceilings, or roofs that are close enough to be ignited by conduction.
- Near baled paper, plastic, packing, and other easily ignited materials.
- In any circumstance where sufficient ventilation is not present to prevent hazardous levels of toxic vapors or products of combustion.
- If work cannot be performed in a safe manner.

## 6.2 Personal Protective Equipment

All personal protective equipment (PPE) to be used must meet the requirements:

- Full-face protection, adequate eye protection, and protective clothing (flame resistant gloves, sleeves and aprons, hard hats, shoes) which insulate against heat, sparks and electricity must be worn.
- Welding screens must be used as required to protect nearby employees and property from arc welding rays and sparks.
- Respiratory protection must be used when work practices and ventilation equipment are not able to effectively control respiratory exposure to airborne contaminants. Refer to the ABMFS Respiratory Protection Program to ensure proper employee training and medical evaluations are performed.

**NOTE:** Ultraviolet light and infrared radiation generated by electric arcs and gas flames can “sunburn” the eyes and skin. Therefore, welders shall wear suitable flame resistant protective clothing and appropriate eye and face protection. The work area should be adequately protected to prevent in advertent exposure to personnel in the immediate area.

## 6.3 Standard Operating Procedure

### a. Preparations

- 1) Employees/Contractors performing hot work:
  - Arrange for a trained/qualified person to act in the position of Fire Watch.
  - Prepare the area for hot work by taking the precautions listed on the permit and in this procedure.
  - Contact a Hot Work Authorizer to obtain a hot work permit.
- 2) Hot Work Authorizer
  - Determine if hot work will generate fire alarm activation. If so, contact the appropriate personnel and follow the procedures for deactivating the fire detection system or implementing other means, such as smoke detector covers, to preventing activation of the fire alarm system by the hot work operations.
- 3) Fire Watch

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## Hot Work Program



- Obtain the proper size and type of fire extinguishing equipment and have it ready for instant use. In no case will the extinguishing equipment be more than 10 feet from the Fire Watch and 30 feet from the work area. This extinguisher cannot be obtained by removing it from another location that requires an extinguisher.

- Obtain other fire control and extinguishing materials, such as fire blankets, when needed.

#### 4) Hot Work Authorizer:

- Inspect the work area to ensure that appropriate precautions have been taken. Evaluate appropriate engineering controls to reduce risks during hot work. Controls can include draining and purging of lines or tanks, using blind flanges, using work methods with a minimal spark or slag production or inerting of the work area.
- If flammable atmospheres are possible, utilize an oxygen/flammability (LEL/LFL) meter to ensure levels are acceptable before performing work. If conditions are not acceptable, ventilate area to bring conditions to acceptable levels.
- Ensure a means for summoning emergency assistance is available. (Notifications may be by manual fire alarm activation, two-way radio communication, security officer monitoring or using the buddy system.)
- With assistance from the employees/contractors performing the hot work, complete sections 1 - 14 of the hot work permit.
- Post a copy of the permit near where the hot work will occur.
- Notify security or other responsible representatives, as necessary, that hot work is about to commence.

#### **b. During the Performance of Hot Work**

The Fire Watch observes and continuously patrols the work area for any signs of fire, smoldering material, and brands or lives sparks. If sparks or brands are falling on combustible material or are endangering people, the Fire Watch should inform those performing the hot work and stop the work until property and personnel are suitably protected. Immediately call the site emergency phone number and activate the fire alarm system if a fire occurs.

#### **c. After Hot Work is Complete**

##### 1) Fire Watch and Employees/Contractors Performing Hot Work:

- Clean up the area while continuing to look for signs of fire or smoldering materials.
- Report to the Hot Work Authorizer when work is completed.

##### 2) Fire Watch:

- Remain at the work area for at least 30 minutes after the work has been completed and the work surfaces cooled down to ensure no combustion is occurring. Brands and sparks from such work can smolder for a long time before producing visible smoke or flame.
- Complete section 15 of the hot work permit and provide completed permit to Hot Work Authorizer.

##### 3) Hot Work Authorizer:

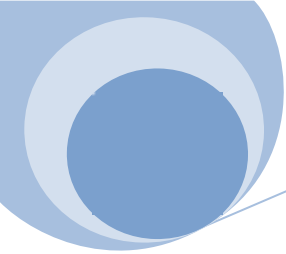
- File completed permit in the appropriate location.

### **7 Training Requirements**

All personnel involved in hot work operations shall receive the appropriate training to perform their assigned function. No employee shall perform hot work operations without appropriate training.

The following are the training requirements by responsibility:

- Employees performing hot work operations must be:
  - Fully trained to perform such duties, including the full understanding of all relevant regulations. The training for those performing welding operations shall be composed of a minimum of 8 hours and/or comprised of an employee technical/safety competency review.



# ABM Technical Addendum

## Hot Work Program



- Trained on safe work practices, including the proper use and maintenance of PPE, related to hot work operations.
- Managers, Supervisors, Hot Work Authorizers and Fire Watch personnel who authorize or supervise hot work operations must be trained on the hazards, safe work practices, personal protective equipment, fire extinguisher use, and emergency procedures.

### **8 Recordkeeping Requirements**

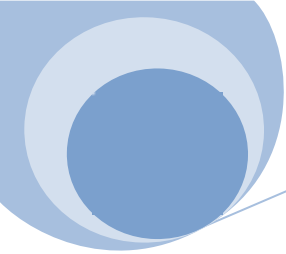
Hot work permits and all training records pertaining to hot work operations must be retained and readily available for review by management and safety personnel.

### **9 References**

29 CFR 1910 Subpart Q, Sections 251-255, Welding, Cutting and Brazing  
NFPA 51B Standard for Fire Prevention during Welding, Cutting, and Other Hot Work.

### **10 Attachments**

Hot Work Permit



# ABM Technical Addendum

## Hot Work Program

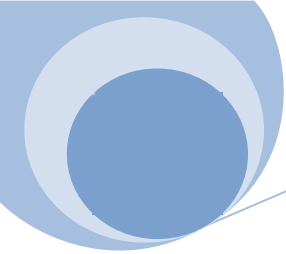


*All temporary operations involving open flames or producing heat and/or sparks require a hot work permit. This includes, but is not limited to, Brazing, Cutting, Grinding, Soldering, Thawing, and Welding.*

Before hot work is performed, the Authorizer must evaluate the need for hot work. If it is deemed necessary to proceed with the hot work, the Authorizer must consider if hazardous conditions and/or materials are present and take appropriate precautions to eliminate the hazard. The Authorizer must also evaluate the likelihood of toxic fumes and by-products being created by the work and the need for additional ventilation and for respiratory protection.

|  |   |   |                          |                          |  |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
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| 1. Hot work authorizer's name:<br>_____  | 2. Date & Time of work:<br>Date: _____<br>Time: _____   | 3. Have emergency fire response procedures been reviewed?<br><input type="checkbox"/> Yes <input type="checkbox"/> No |                          |                          |  |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| 4. Is lockout/tagout required?<br><input type="checkbox"/> Yes <input type="checkbox"/> No   | 6. Hot work equipment to be used:<br>_____  |   |                          |                          |  |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| 5. Is a confined space permit required?<br><input type="checkbox"/> Yes <input type="checkbox"/> No  |   |   |                          |                          |  |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| 7. Location / Building & Floor:<br>_____   |   |   |                          |                          |  |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| 8. Reasons for completing this hot work permit (check all that apply)<br><input type="checkbox"/> Combustible materials in the work area<br><input type="checkbox"/> Work area has potential for flammable vapors<br><input type="checkbox"/> Work area has potential for an oxygen-enriched atmosphere<br><input type="checkbox"/> Work will be done in permanent location  | 9. Flammable/combustible material removed within 35-feet:<br><input type="checkbox"/> Yes <input type="checkbox"/> No |   |                          |                          |  |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| 10. Procedures to be used during hot work:   |   |   |                          |                          |  |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> <td></td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> <td></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Lockout/tagout</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Fire watch</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Test for flammable atmosphere with gas detector</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Confined space entry procedure</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Erect fire-resistant barriers</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Displace pipeline/tank with water</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Place fire extinguisher around work site</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Ventilate area to control flammable vapors</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Wet down floor</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Clear work area of combustibles</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Cover floor with wet sand</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Place water hoses around work site</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Drums filled with wet sand</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Airborne dust eliminated</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Drums filled with water</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Other: _____</td> </tr> </table> | Yes   | No  |                          | Yes                      | No   |  | <input type="checkbox"/> | <input type="checkbox"/> | Lockout/tagout | <input type="checkbox"/> | <input type="checkbox"/> | Fire watch | <input type="checkbox"/> | <input type="checkbox"/> | Test for flammable atmosphere with gas detector | <input type="checkbox"/> | <input type="checkbox"/> | Confined space entry procedure | <input type="checkbox"/> | <input type="checkbox"/> | Erect fire-resistant barriers | <input type="checkbox"/> | <input type="checkbox"/> | Displace pipeline/tank with water | <input type="checkbox"/> | <input type="checkbox"/> | Place fire extinguisher around work site | <input type="checkbox"/> | <input type="checkbox"/> | Ventilate area to control flammable vapors | <input type="checkbox"/> | <input type="checkbox"/> | Wet down floor | <input type="checkbox"/> | <input type="checkbox"/> | Clear work area of combustibles | <input type="checkbox"/> | <input type="checkbox"/> | Cover floor with wet sand | <input type="checkbox"/> | <input type="checkbox"/> | Place water hoses around work site | <input type="checkbox"/> | <input type="checkbox"/> | Drums filled with wet sand | <input type="checkbox"/> | <input type="checkbox"/> | Airborne dust eliminated | <input type="checkbox"/> | <input type="checkbox"/> | Drums filled with water | <input type="checkbox"/> | <input type="checkbox"/> | Other: _____ |  |  |
| Yes  | No  |   | Yes                      | No                       |  |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>  | Lockout/tagout  | <input type="checkbox"/> | <input type="checkbox"/> | Fire watch                                 |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>  | Test for flammable atmosphere with gas detector   | <input type="checkbox"/> | <input type="checkbox"/> | Confined space entry procedure             |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>  | Erect fire-resistant barriers   | <input type="checkbox"/> | <input type="checkbox"/> | Displace pipeline/tank with water          |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>  | Place fire extinguisher around work site  | <input type="checkbox"/> | <input type="checkbox"/> | Ventilate area to control flammable vapors |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>  | Wet down floor  | <input type="checkbox"/> | <input type="checkbox"/> | Clear work area of combustibles            |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>  | Cover floor with wet sand   | <input type="checkbox"/> | <input type="checkbox"/> | Place water hoses around work site         |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>  | Drums filled with wet sand  | <input type="checkbox"/> | <input type="checkbox"/> | Airborne dust eliminated                   |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>  | Drums filled with water   | <input type="checkbox"/> | <input type="checkbox"/> | Other: _____                               |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |
| 11. Ventilation to be used:<br><input type="checkbox"/> Natural (work is outside)<br><input type="checkbox"/> Building mechanical system (ventilation is adequate and no heavy metals used)<br><input type="checkbox"/> Forced/local ventilation (confined space, heavy metal use, or limited existing ventilation)<br><input type="checkbox"/> Other: _____   |   |   |                          |                          |  |  |                          |                          |                |                          |                          |            |                          |                          |   |                          |                          |                                |                          |                          |                               |                          |                          |                                   |                          |                          |  |                          |                          |  |                          |                          |                |                          |                          |                                 |                          |                          |                           |                          |                          |                                    |                          |                          |                            |                          |                          |                          |                          |                          |                         |                          |                          |              |  |  |





# ABM Technical Addendum

## Hot Work Program



**12. Personal protective equipment to be used:**

- |   |   |
|---|---|
| <input type="checkbox"/> No respiratory protection required<br><input type="checkbox"/> Air purifying respirator required (heavy metal used)<br><input type="checkbox"/> Air supplied respirator required (confined/limited space)<br><input type="checkbox"/> Protective clothing<br><input type="checkbox"/> Face shield<br><input type="checkbox"/> Other: _____ | <input type="checkbox"/> Safety glasses with side shields<br><input type="checkbox"/> Welding glasses with side shields<br><input type="checkbox"/> Gloves<br><input type="checkbox"/> Hard hat<br><input type="checkbox"/> Welder's hood |
|---|---|

**13. Persons conducting hot work:**

- |                                 |   |
|---------------------------------|---|
| _____<br><br>_____<br><br>_____ | Name<br><input type="checkbox"/> Employee <input type="checkbox"/> Contractor<br><br>Name<br><input type="checkbox"/> Employee <input type="checkbox"/> Contractor<br><br>Fire Watch<br><input type="checkbox"/> Employee <input type="checkbox"/> Contractor |
|---------------------------------|---|

**14. This permit is authorized and issued by a hot work authorizer.**

Name \_\_\_\_\_  
Signature \_\_\_\_\_

**15. Fire watch has been maintained for at least 30 minutes after completion of hot work. All ignition sources have been extinguished. This permit is closed.**

Date/Time \_\_\_\_\_

Fire Watch Name \_\_\_\_\_ Signature \_\_\_\_\_

# ABM Technical Addendum

## Universal Waste Program



### 1. POLICY

Recycling and proper disposal programs that are in compliance with federal, state, and local regulations shall be established for Universal Waste generated as a result of ABM operations.

### 2. RESPONSIBILITIES

Management shall know and understand which products and tools used by ABM employees become universal waste. Management shall determine which, if any, job sites or warehouse locations generate Universal Waste, the quantity, and whether the site is a small or large quantity handler. Management shall implement procedures for the proper handling, storage, and disposal of Universal Waste.

Employees shall not dispose of Universal Waste into the regular trash. They shall know and understand how to dispose of the type of waste that is generated as a result of ABM operations.

### 3. REGULATION AND DEFINITION

Universal Wastes are hazardous wastes that are universally used and pose a lower risk to people and the environment than other hazardous wastes. These products are not a hazard in and of themselves, but contain toxic materials that can cause harm to people and the environment once they are discarded. Universal Wastes must be recycled and are not permitted to be placed into regular trash for disposal. National regulation of Universal Waste is enforced by the Environmental Protection Agency ([EPA](#)). Most States, and many local governments have legislated additional regulations. Management at each ABM site must be aware and knowledgeable of these local requirements.

Universal Wastes include:

- A. Batteries – alkaline batteries, NiCd, small sealed lead acid batteries, Lithium, etc.
- B. Lamps – fluorescent, high intensity, sodium vapor, etc.
- C. Mercury Containing Equipment – thermometers, thermostats, etc.
- D. Non-empty Aerosol Cans,
- E. Pesticides,
- F. Electronics – cell phones, computers, monitors, televisions, etc.

Note: Automotive-type lead acid batteries, because they contain acid electrolyte, are hazardous waste and must be handled as such.

Because of the volume of Universal Waste that is generated in the community, and the lesser risk, the disposal requirements for these products are different and simpler than other hazardous wastes, with strong emphasis on recycling. Many of the hazardous components used in these items are able to be extracted and processed as either hazardous waste, or into new products. The waste stream for these products must be separate from [Hazardous Waste](#), or from other recyclable materials such as paper or plastic. Specialized disposal centers provide a variety of services for disposal and recycling of Universal Waste. Contact the Division or Region Safety Director, or ABM's Corporate Safety Department to discuss available options.



# ABM Technical Addendum

## Universal Waste Program



#### 4. UNIVERSAL WASTE HANDLER

The EPA makes a distinction between a “generator” of Hazardous Waste, and a “handler” of Universal Waste. There are two categories of Universal Waste handlers – Small Quantity Handlers (SQHUW) and Large Quantity Handlers (LQHUW).

Handler regulations apply to a single site, not to the whole organization. EPA permits small quantity handlers to accumulate up to 5,000 kilograms (11,000 lbs) of Universal Waste at any time. If the 5,000 kilogram limit is exceeded at any time, the location becomes a Large Quantity Handler, and is subject to LQHUW regulations for, at least, the remainder of the calendar year. In addition to the SQHUW requirements, a LQHUW location must obtain an EPA Identification Number, and must document waste shipments. Local regulations may differ from those mandated by EPA.

ABM shall not be a commercial transporter of Universal Waste.

#### 5. UNIVERSAL WASTE LABELING AND STORAGE

Regulations require that Universal Waste shall be labeled with the words “Universal Waste” and the type of waste (e.g., “Batteries”). All original labels should be kept on the waste product. Waste can accumulate and be stored for no more than one (1) year from the date the Universal Waste was generated. Accumulated waste shall be collected in labeled containers and transported to a disposal facility according to regulations. Universal waste and Hazardous waste accumulated quantities are calculated separately and are not affected by the amount of the other waste generated.

#### 6. EMPLOYEE TRAINING

Employees shall be informed of the requirements for proper disposal of Universal Waste. Unless a site becomes a large quantity handler (LQHUW), no further training is required.

#### 7. RECORDS

Required records for the transport of Universal Waste shall be kept at the site office or the designated area of our customer if the customer is the universal waste handler/generator.

# ABM Technical Addendum

## General Housekeeping Program



### 1. Policy

It is the policy of ABM that site employees comply with established programs to ensure good housekeeping controls for all work locations.

Housekeeping is a component of all processes, operations, and tasks performed in the workplace and an integral part of every job. All employees must be made aware of housekeeping hazards in the workplace, concentrating on high traffic areas; near stairs, platforms and ladders; around work stations and machines; and in chemical and material storage areas.

### 2. Purpose

The purpose of this program is to establish policy and procedures for ensuring good housekeeping and sanitation controls for all ABM Facility Solutions work locations, making policy and procedure a standard of operations.

### 3. Scope

This program applies to all ABM sites, projects and employees. This policy will include procedures for ensuring the ABM work environments are clean and orderly for all employees.

### 4. Responsibilities

#### Facility Manager:

- Ensures all managers and supervisors/lead personnel and employees have received training necessary to manage their responsibilities as required by this program.
- Ensures resources are available for methods of compliance and implementation of this program.
- Ensures required inspections and audits are performed to verify compliance with this program.
- Ensures an action plan is in place to ensure any discrepancies identified during the inspections and audit program have been addressed.
- Communicates out-of-compliance findings for resolution for areas of responsibility with Customer Project Manager.

#### Supervisors/Lead Personnel:

- Supervisors are responsible for monitoring work areas for the following and ensuring the necessary conditions and precautions taken to prevent injuries associated with substandard walking and working surfaces.
- Provides guidance and supervision for implementation of program requirements.
- Ensures all employees have received training necessary to manage their responsibilities as required by this program.
- Performs inspections and audits necessary to assure compliance with this program.
- Ensures action plan for audit discrepancies have been addressed and completed.

#### Employees:

- Performs their work according to established safe work practices and procedures.
- Participates in scheduled training sessions.
- Understands the exposures within their job responsibilities associated with this Program.
- Reports any potential hazards or noncompliance issues to their supervisor.

# ABM Technical Addendum

## General Housekeeping Program



### 5. Definitions

**MSDS:** Material Safety Data Sheet

**PPE:** Personal Protective Equipment

### 6. Program Requirements

OSHA requires the workplace be kept clean and orderly and good housekeeping is a necessary component for maintaining safety and avoiding accidents. People, tools and the work environment must work together to help prevent accidents.

Before starting your work activity, look around, identify possible safety hazards and correct them before beginning your tasks. If you cannot correct the hazard immediately, take extra precaution and be sure to report the hazard to a supervisor. While working on our customers' sites can make this even more challenging; you can still make a difference by following the basic rules of good housekeeping safety.

To ensure that proper housekeeping is maintained, a continuous process involving all personnel is required.

1. Plan your day.
2. Monitor your surroundings.
3. Where available, refer to safety inspections and walk-through surveys to help recognize, evaluate and control hazards that may be created by lack of proper housekeeping.
4. Clean-up, store and secure items properly.
5. Pick up after yourself.

#### 6.1 Safe Walking and Working Surfaces

- Plan your tasks and determine what you need to help minimize unnecessary clutter around your work area.
- Permanent aisles and passageways shall be appropriately marked.
- Make sure switches, light and equipment are properly operating.
- All work areas, passageways, stairwells, exits and all other areas shall be kept free of debris, equipment and materials. Do not block exit doors and/or emergency equipment.
- All materials are stored in an orderly manner. Exit passageways and stairwells shall be kept free of storage.
- Aisles and passageways shall be kept in good repair with no obstruction across or in aisles that could create a hazard.
- Electric welding leads, cords, wires, electrical cables, hoses, and other temporary systems are kept off the walking surface in an elevated position.
- Floor surfaces shall be maintained in a clean and dry condition.
- Keep floors dry (dry as possible); slip-resistant; and free of waste, unnecessary material, oil and grease, protruding nails, splinters, holes, or loose boards.

# ABM Technical Addendum

## General Housekeeping Program



- Where wet processes are used, drainage shall be maintained and false floors, platforms, mats or other dry standing places should be provided where practicable.
- Appropriate trash containers are strategically placed and used for disposal of scrap materials and other generated debris. Waste receptacles shall be constructed so it does not leak and may be thoroughly cleaned and maintained in a sanitary condition.
- Containers shall be supplied for the separation of waste. Those containers intended to be used for the containment of combustible, flammable, or toxic wastes shall be constructed of metal and equipped with covers. Containers shall be emptied at regular and frequent intervals.
- Scrap lumber, waste material, and rubbish is removed from the immediate work area as the work progresses.
- Construction areas shall be cleaned and arranged by safe means on a daily basis to preclude the creation of tripping, slipping, and fire hazards.
- Work areas shall be constructed, equipped and maintained to prevent the harborage of rodents, insects and other pests. An effective pest extermination program shall be in place.
- Trash and waste materials shall be removed to avoid creating a health and/or safety hazard or environmental concern.
- Eating areas are kept clean and free of all food scraps, wrappers, cups, and other disposable items.
- When your task is completed, put all materials and tools back in their designated place.
- Liquids (such as paints, solvents, thinners, oils and greases) and any other material or containers, which contain chemicals, are disposed in accordance with the hazardous waste procedures and regulatory requirements.
- All solvent waste, oily rags and flammable liquids are kept in fire-resistant covered containers until removed from the worksite.
- Other things to remember:
  - Know the strength and stability of the support when piling materials. Watch the height so it does not topple.
  - Properly clean and sanitize tools to prevent product contamination.
  - Follow good housekeeping practices to the inside of your work vehicle. Store and secure items properly in your work vehicle.
  - Proper clothing and shoes should be clean at the start of each shift.
  - Where applicable, this applies to areas prepared by earthmoving equipment or reclaimed areas after demolition work.

### 6.2 Chemical Spills

- Areas where chemicals may be used or stored must be maintained using good housekeeping best management practices.
- Adequate spill response materials or spill kits must be available in areas which are at risk to spills, such as fuel ports, liquid bulk storage, generators, and water treatment chemical stations.

# ABM Technical Addendum

## General Housekeeping Program



- Chemicals shall be stored in proper containers, adequately labeled, and within designated storage areas.
- Store liquid bulk containers (i.e., drums or totes) on spill pallets while in use in order to minimize spills.
- Chemical container must be kept closed when not in use, and stored so they are not exposed to rain/stormwater.
- If a hazardous material spill occurs or is discovered, to include petroleum products, the employee must immediately notify the designated emergency contacts, to include the Fire Department, Client, Site Manager and Site Safety Representative.
- Spills must be cleaned up by individuals trained to respond to hazardous material spills, and shall be done promptly and disposed of properly. (Reference the product's MSDS to ensure proper response procedures, PPE usage and handling, storing and disposal procedures)

### 6.3 Flammable and Combustible Liquids

- Approved, properly labeled, storage cabinets shall be supplied for the storage of flammable liquids in quantities exceeding 15 U.S. gallons (56.8 L).
- Flammable and combustible liquids shall not be stored in areas used as exits, stairways, or passageways, and shall not adversely affect the means of egress.
- Do not eat, drink or smoke in prohibited areas. Clear and legible signs shall be posted.
- Combustible liquids, including oil or grease, shall be stored in containers or storage tanks labeled with contents and tank capacity. Each tank shall be:
  - Capable of withstanding working pressures and stresses compatible with the type of liquid stored
  - Maintained in a manner that prevents leakage
  - Located in an area free of combustible materials
  - Vented or otherwise constructed to prevent development of pressures or vacuum as a result of filling, emptying, or atmospheric temperature changes.
- Particular care should be taken when welding and cutting in locations where combustibles are exposed. When such welding or cutting is done, the surrounding area shall be inspected.
- Combustible material shall be removed or protected with fire-resistant blankets or equivalent, and an adequate number of approved fire extinguishers shall be immediately available.

### 6.4 Compressed Gas Cylinders

- Compressed gas cylinder valves shall be closed whenever (1) work is finished, (2) the cylinders are empty, or (3) the cylinders are moved. Furthermore, compressed gas cylinders shall:
  - Be secured in an upright position at all times, except for short periods when being carried or hoisted.
  - Be transported in an upright position and shall not be hauled in equipment beds or truck beds on their side. Cylinders lifted from one elevation to another shall be lifted only in racks or containers designed for that purpose. Slings shall not be used to hoist cylinders.
  - Be stored/located to avoid exposure to sparks, hot slag, or flames. If these cannot be avoided, fire-resistant shields shall be provided.

# ABM Technical Addendum

## General Housekeeping Program



- Not be used as rollers, but stored in an upright position. Cylinders in storage shall be separated (oxygen from fuel gas) by a 5-foot-high (1.5 m) barrier with a 1-hour fire rating or by a distance of 20 feet (6.1 m). Gas cylinders shall be secured in place during use and storage.
- Be stored in well-protected, ventilated, dry locations, at least 20 feet (6.1 m) from highly combustible materials, and away from egress routes such as stairways and elevators.
- Be returned to the main storage area when empty.
- Not be transported with gauges attached. The gauges shall be removed from cylinders and protective caps installed during transportation.

### 7. Training

- Hazard Communication
- Compressed Gas
- Spill Prevention and Response

### 8. Record Retention

Audit inspections for general housekeeping and sanitation will be retained for a minimum of one year.

### 9. References

29 CFR 1910.22: Walking Working Surfaces (General Requirements)  
29 CFR 1910.101: Compressed Gases (General Requirements)  
29 CFR 1910.1200: Hazard Communication

### 10. Attachments

None



### 1. Introduction

Silica is the second most common mineral on earth, found in the common form as “sand” and “rock”. Silica is the compound formed from the elements silicon (Si) and oxygen (O) and has a molecular form of  $\text{SiO}_2$ . The three main forms or ‘polymorphs’ of silica are alpha quartz, cristobalite and tridymite. The polymer most abundant and most hazardous to human health is alpha quartz, and is commonly referred to as crystalline silica.

### Health Hazards Associated with Silica Exposure

The health hazards of silica come from breathing in the dust. If crystalline silica becomes airborne through industrial activities, exposures to fine crystalline silica dust (*specifically exposure to the size fraction that is considered to be respirable*) can lead to a disabling, sometimes fatal disease called silicosis. The fine particles are deposited in the lungs, causing thickening and scarring of the lung tissue. The scar tissue restricts the lungs’ ability to extract oxygen from the air. This damage is permanent, but the symptoms of the diseases may not appear for many years. As noted in the following Figure, (respirable) silica dust is very small, and is not visible to the human eye.

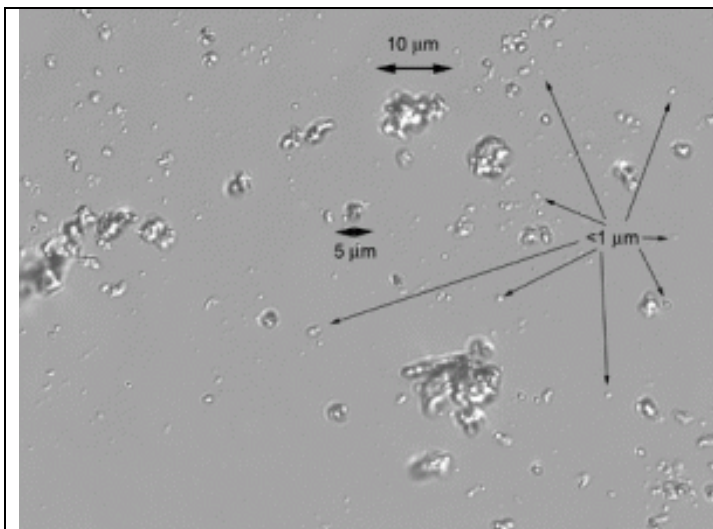
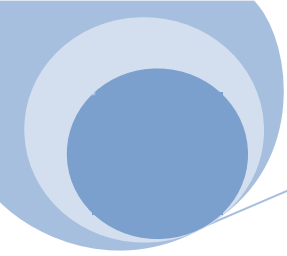


Figure 1: Crystalline silica up close. 1000 times magnification of sand dust. These particles are small enough to be trapped in lung tissue.

A worker may develop any of three types of silicosis, depending on the concentration of silica dust and the duration of the exposure:



# ABM Technical Addendum

## Crystalline Silica Exposure Control Policy



- Chronic Silicosis: Develops after 10 or more years of exposure to crystalline silica and relatively low concentrations.
- Accelerated Silicosis: Develops 5 to 10 years after initial exposure to crystalline silica at high concentrations.
- Acute Silicosis: Develops within weeks, or 4 to 5 years, after exposure to very high concentrations of crystalline silica.

Initially, workers with silicosis may have no symptoms; however, as the disease progresses, workers may experience:

- Shortness of Breath.
- Severe Cough.
- Weakness.

These symptoms can worsen over time and lead to death. Exposure to silica has also been linked to other diseases, including bronchitis, tuberculosis, and lung cancer.

### Silica Exposures at ABM

Many of the activities performed on ABM Projects result in the creation/release of silica dust, thus exposing our employees. These activities include, but are not necessarily limited to:

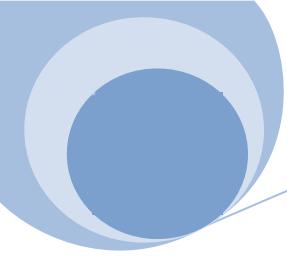
Examples include:

- *Sweeping*
- *Jack-hammering*
- *Saw-cutting*
- *Drilling (of concrete)*
- *Excavating and Truck Loading activities.*

#### 2. Statement of Purpose

ABM is committed to providing a safe and healthy workplace to our employees, recognizing the right of workers to work in a safe and healthy work environment and ensuring that

ABM's activities do not adversely affect the health and safety of any other persons.



# ABM Technical Addendum

## Crystalline Silica Exposure Control Policy



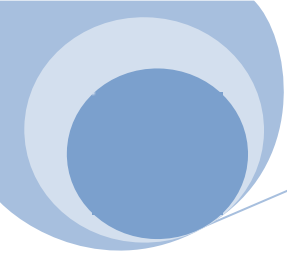
This commitment includes ensuring every reasonable precaution is taken to protect our employees (and others) from the adverse health effects associated with exposure to silica.

### 3. Responsibilities

Due to the risk posed by respirable silica, it is critical that all personnel involved in activities that could potentially create silica dust take specific actions to ensure that, as much as practicable, a hazard is not created. In recognition of this, the following (Silica related) responsibilities have been established and must be adhered to:

#### **ABM Management is responsible for:**

- Regularly evaluating new equipment and technologies that become available, as able/appropriate, purchasing the “best available” equipment/technologies (*within ABM’s capabilities*). Equipment/technologies with (silica) dust suppression and/or capture technologies will generally be given preference over equipment/technologies that lack such.
- Implementing a suitable respirable silica exposure monitoring program, or otherwise ensuring representative exposure monitoring results are available. The purpose of the program will ensure that (*over time*) ABM has quantifiable silica exposure data available for all regularly occurring, as well as reasonably foreseeable, work activities.
- Ensuring project and/or task specific Exposure Control Plans (ECPs) are developed communicated and effectively implemented as appropriate.
- Ensuring that all employees (*i.e. Managers, Supervisors and Workers*) receive the necessary education and training related to this Policy, as well as project/task specific ECPs.
- Maintaining applicable records (*i.e. exposure sampling, inspections, respirator fit tests, training records, etc.*) in accordance with ABM’s record retention procedures/practices.
- (*In conjunction with the ABM Health & Safety Committee*) ABM will Conduct a review of this Policy, as well as: (1) project/task specific ECP’s, (2) available exposure monitoring data, (3) Industry/Regulatory information, and (4) new/emerging equipment/technologies on a regular (*i.e. annual*) basis.



# ABM Technical Addendum

## Crystalline Silica Exposure Control Policy



### **ABM Supervision (i.e. Superintendents/Foreman) are responsible for:**

- Obtaining a copy of the project/task specific ECPs (*and/or other similar such information*), and ensuring such are made available at each work site.
- Ensuring that all the tools, equipment, PPE and materials (*including water*) necessary to implement the ECP is available (*and in good working order*) prior to allowing work activities to commence.
- Ensuring that all workers (*under the supervisor's direction and control*) have received the necessary education and training. As appropriate, each supervisor must ensure that workers are available to "demonstrate competency" for identified tasks.
- Ensuring that workers adhere to the project/task specific ECP, including PPE and personal hygiene (*i.e. including be clean shaven where the respirator seals to the user's face*) requirements.
- Coordinating work activities with the Owner/Prime Contractor as required, and/or otherwise implementing the controls necessary to protect others (*i.e. erecting of barricades and signage*) who could be adversely effected by ABM's acts (*or omissions*).

### **ABM Employees (and subcontracted employees) are responsible for:**

- Knowing the hazards of silica dust exposure.
- Using the assigned protective equipment in an effective and safe manner.
- Working in accordance with the project/task specific ECP.
- Reporting (*immediately*) to their supervisor, any hazards (*i.e. unsafe conditions, unsafe acts, improperly operating equipment, etc.*).

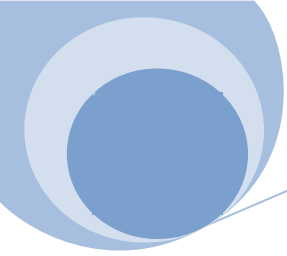
#### **4. Exposure Limits**

**Exposure Limits/Considerations:** The Occupational Health & Safety Regulation (OHSR) lists an occupational exposure limit (OEL) for respirable crystalline silica (including quartz) of 0.025 milligrams per cubic metre (mg/m<sup>3</sup>). This is a concentration to which nearly all workers could be exposed for eight hours a day, five days a week, without adverse health effects. However, as a suspected carcinogen, crystalline silica is also an ALARA substance, and exposures must be reduced to levels **A**s **L**ow **A**s **R**easonably **A**chievable below the OEL.

#### **5. Risk Identification**

**Risk Identification:** Silica is contained on many of the products used/encountered on ABM's Projects and (silica) dust can be readily released through the various tasks performed by ABM.

The health hazards of silica come from breathing in the dust. In addition to identifying the specific activities/areas where personnel could be exposed to silica dust, the "amount" of exposure and "duration" of exposure must also be considered. With consideration to these three factors, activities performed by ABM (*or that are otherwise occurring in proximity to ABM's activities*) that expose our



# ABM Technical Addendum

## Crystalline Silica Exposure Control Policy



employees (*as well as members of the public and other workers*) to the dust include, but are not necessarily limited to:

- Surface preparation activities such as: (1) the use of Blow-Packs, (2) the use of Bobcats with “sweeper” attachments, (3) the use of Sweeper trucks and (4) hand sweeping.
- Jack-hammering (*of both asphalt and concrete*).
- Saw-cutting (*of both asphalt and concrete*).
- Drilling (*of concrete*).
- Granular Surface Preparation activities (*i.e. grading and rolling*), and
- Operation and use of milling equipment/machinery (*i.e. milling and conveyance/discharge of milled materials on conveyor*).

### 6. Risk Assessment

**Risk Assessment:** ABM will use a variety of methods to assist with the “assessment” of (*possible and actual*) silica exposures. These methods will include, but may not necessarily be limited to:

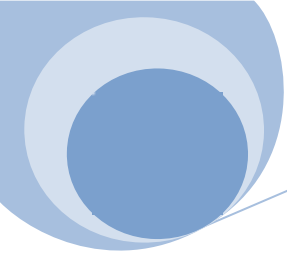
- Reviewing data/reports available in the public domain (*i.e. Information available through regulatory agencies and industry associations*).
- Regularly consulting with the Safety Resources/Safety Managers from firms who perform similar work.
- Implementing a suitable respirable silica exposure monitoring program. This program will ensure that (*over time*) ABM has quantifiable silica exposure data available that is representative of all regularly occurring, as well as reasonably foreseeable work activities. Exposure monitoring will generally be conducted “in-house”, although assistance (*i.e. actual monitoring and/or interpretation of results*) may be obtained through outside consultants/hygienists.

### 7. Risk Control

**Control Methods:** When determining measures to reduce or eliminate worker exposure to silica dust, ABM will generally select a combination of controls, listed in order of preference:

- Elimination and Substitution.
- Engineering.
- Administrative.
- Personnel Protection Equipment (PPE).

**Substitution and Elimination:** Whenever possible, ABM will substitute products containing silica with products that do not contain (*or contain a lower percentage of*) crystalline silica. While there have historically been few “substitution” options available, ABM recognizes the importance of planning work in order to minimize the amount of silica dust generated. During the planning phases of a project, ABM will advocate for the use of methods that reduce the need for cutting, grinding, or drilling of concrete surfaces.



# ABM Technical Addendum

## Crystalline Silica Exposure Control Policy



**Engineering Controls:** Engineering controls are those controls which aim to control or otherwise minimize the release of crystalline silica. Two “common” engineering control options are available to ABM in many circumstances. These include the Local Exhaust Ventilation (LEV) and Wet Dust Suppression (WDS) systems.

**LEV Systems:** Tools/appliance specific LEV systems are available on some tools/appliances. Such LEV systems are generally comprised of a shroud assembly, a hose attachment, and a vacuum system. Dust-laden air is collected within the shroud, drawn into the hose attachment, and conveyed to the vacuum, where it is filtered and discharged. “Large scale” LEV systems, such those available on some Vacuum Trucks and Mobile Sweepers, may also be employed (at times) on ABM projects.

When/if LEV systems are used, ABM will employ the following systems and safe work practices:

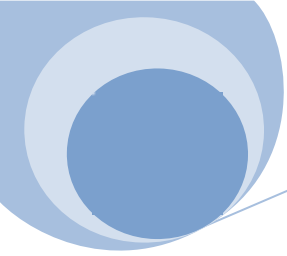
- Vacuum attachment systems that capture and control dust at its source whenever possible.
- Dust control systems will be maintained in optimal working condition.
- Grinding wheels will be operated at the manufacturer’s recommended RPM (*operating in excess of this can generate significantly higher airborne dust levels*).
- HEPA or good quality, multi-stage vacuum units (*approved for use with silica dust*) will be used in accordance with the manufacturer’s instructions.
- Whenever possible, concrete grinding will be completed when the concrete is wet (*thus dust release will be significantly reduced*).

**WDS Systems:** Unlike LEV systems, many tools/appliances at ABM are equipped with WDS systems (*i.e. on the Milling equipment, sweeper equipped Bobcats, as well as attachments on various hand held/portable, abrasive/cutting equipment*). When WDS Systems are not available, (*as a standard or retrofitted part of a tool/appliance*), similar effects can also be achieved by manually wetting the surface (*i.e. with a mister or with a hose*).

When WDS systems are used, ABM will employ the following systems and safe work practices:

- If water is not readily available on the specific ABM project, the project supervisor will arrange to have a water tank delivered to the site for use.
- Pneumatic or fuel (*i.e. gasoline*) powered equipment will generally be used instead of electrically powered equipment if water is the method of dust control, unless the electrical equipment is specifically designed to be used in such circumstances.
- Pressure and flow rate will be controlled in accordance with the tool manufacturer’s specifications.
- When sawing concrete, tools that provide water directly to the blade will be used if possible.
- Wet slurry will be cleaned from work surfaces when the work is complete, if/when necessary.

**Administrative Controls:** Administrative controls are those that aim to control or otherwise minimize the release of silica through the use of work procedure and work methods, rather than by affecting the actual physical work. Common examples of administrative controls include, but are not limited to:



# ABM Technical Addendum

## Crystalline Silica Exposure Control Policy



- Posting of warning signs.
- Rescheduling of work as to avoid the activities of others.
- Relocating unprotected workers away from dusty areas.

When administrative controls are used, ABM will employ the following systems and safe work practices:

- In conjunction with the Owner/Prime Contractor, suitable exposure control strategies (*both within and outside ABM's capabilities/responsibilities*) will be discussed and determined. As necessary/appropriate, supplemental (to this policy/procedure) project and task specific Exposure Control Plans will be developed.
- Suitable housekeeping, restricted work area, hygiene practices, training and supervision procedures/standards will be determined and implemented on ABM projects.
- As appropriate, barriers will be erected around known silica dust generating activities, and/or warning signs will be posted.
- As able, work activities will be scheduled to minimize the silica related effect on, and from, others.

**Personal Protective Equipment Controls:** When used in conjunction with the other (*i.e. Engineering and Administrative*) controls elsewhere identified, personal protective equipment and clothing can help further reduce our employee's exposure to silica dust.

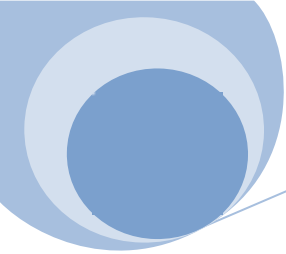
An air purifying respirator fitted with HEPA cartridges is the most common piece of PPE that would be used by ABM to minimize exposure to silica dust. Dependent on the effectiveness of the other (*i.e. engineering*) control measures employed, either a "full face piece" or "1/2 face piece" respirator would be used by personnel (*In the majority of situations a 1/2 face respirator will be used. When working indoors or in other areas with poor ventilation, a full face respirator may be required*). Both of these respirators are "seal dependent", and thus the users must be "fit tested" and clean shaven where the respirator seals to the face.

In addition to respiratory PPE, protective clothing (*i.e. disposable/washable coveralls*) may be used and/or required to help prevent the contamination of the worker's personnel clothing.

### 8. Education and Training

**Education and Training:** Prior to performing activities, or working on project sites where personnel could be exposed to silica dust, ABM will ensure that personnel receive suitable education and training. As necessary, personnel will be trained to a level of "demonstrated competency". While not necessarily an exhaustive list, education and training may include:

- The hazards and risks associated with exposure to silica dust.
- The signs and symptoms of silica related diseases.
- General and specific silica exposure reduction methods/strategies (*i.e. as detailed in the general/specific exposure control plans*).



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## Crystalline Silica Exposure Control Policy



- The use of specific pieces of equipment and control systems (*i.e. LEV and WDS systems*).
- The use and care of respiratory (and other) personal protective equipment.
- How to seek first aid (*i.e. for respiratory related concerns, including those that may be caused/associated with silica dust exposure*), and
- How to report items of the concern (*i.e. those related to silica dust*).

The education and training detailed will be delivered to ABM employees through a variety of forums, including but not necessarily limited to:

- New Employee Orientations.
- Project/Site Orientations.
- Equipment/task specific training (*in accordance with ABM's Policy, all personnel must be trained to a level of "demonstrated competency" prior to using required tools, equipment and appliances*).
- Start of shift "tool box talks".
- Regularly scheduled crew "Tailgate Meetings".
- Notifications and Bulletins (*those developed in house and those acquired from other reputable sources*).

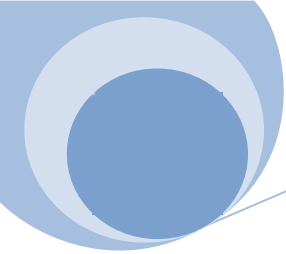
### 9. Safe Work Procedures

ABM will ensure that suitable written procedures for controlling the risk of silica exposure are developed. This document/table summarizes the silica control options generally available on ABM sites/projects, and will be complimented with project/tasks specific Exposure Control Plans as necessary. This document and any supplemental work procedures/ECPs will be made readily available for review by all affected workers.

#### **EXAMPLE**

| Division/Task        |                         | Control Methods   | Personal Protection Equipment     | Comments  |
|----------------------|-------------------------|---|-----------------------------------|---|
| "Company Operations" | 1. Use of flusher truck | No specific engineering/administrative controls required. | No specific PPE controls required | <p>The use of a flusher truck to remove debris/sediment from a surface to prepare it for driving in operations desirable/preferred, as the activity will generally generate little/no silica dust, and will improve drive aisles within the operations.</p> <p>The use of a flusher truck is not always practical/possible for reasons including: (1) increased costs and (2) the</p> |





# ABM Technical Addendum

## Crystalline Silica Exposure Control Policy

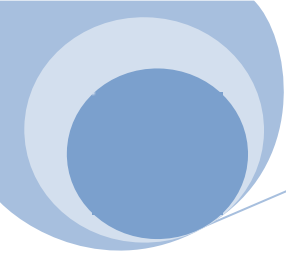


|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  | availability of such equipment, scheduling of staff at exact moments when the flusher truck required. The service will be included in general operator daily duties. Use of recycled water, availability is preferred. |
|--|--|--|--|--|

### 10. Documentation

In accordance with Record/Statistics Procedures detailed in the latest revision of ABM [Here](#)'s "Health & Safety Manual", records associated with Crystalline Silica Program will be maintained in accordance with the following:

| Record Type                                     | Location(s)  | Retention Requirement  |
|---|--|--|
| Silica Policy, Program and Procedure            | <ul style="list-style-type: none"> <li>(i.e. Head Office)</li> </ul> | <ul style="list-style-type: none"> <li>Current Revision</li> </ul>             |
| Project/Task Specific Silica ECPs               | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li>LOP</li> </ul>                          |
| Exposure Monitoring Results                     | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li>LOP</li> <li>LOP + ___ years</li> </ul> |
| Workplace Inspections                           | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li></li> </ul>                             |
| First Aid Records/Reports of Exposure           | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li></li> </ul>                             |
| Incident Investigation Reports                  | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li></li> </ul>                             |
| WorkSafeBC/Regulator Reports and Correspondence | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li></li> </ul>                             |
| Respirator Fit Tests                            | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li>LOE + ___ years</li> </ul>              |
| Equipment Maintenance and Repair Logs           | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li>LOS + ___ years</li> </ul>              |
| New Employee Orientation Records                | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li>LOE + ___ years</li> </ul>              |
| Site/Project Orientation Records                | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li>LOE + ___ years</li> </ul>              |
| Tool Box Talk Records                           | <ul style="list-style-type: none"> <li></li> </ul>                   | <ul style="list-style-type: none"> <li></li> </ul>                             |



# ABM Technical Addendum

## Crystalline Silica Exposure Control Policy



|                                    |   |                   |
|------------------------------------|---|-------------------|
| Crew Safety Meeting Records        | • | •                 |
| Job/Task Specific Training Records | • | • LOE + ___ years |

\*LOP – Length of Project

\*LOE – Length of Employment

\*LOS – Length of Service

# ABM Technical Addendum

## Radio Frequency Wave Program



### 1. Purpose

The purpose of this Radio Frequency Waves Procedure is to prevent incidents while ABM employees perform work in areas in which there is a potential for Radio Frequency Waves to cause injury or illness. This Radio Frequency Waves Procedure provides the framework for hazard identification, risk assessment, and determination of controls.

### 2. Scope

This procedure applies to all employees of ABM and any Subcontractor under contract to ABM whenever in the course of work at any workplace.

### 3. Hazard Assessment

Whenever employees are at risk from their work or work environment, the employee's supervisor must assess the hazards in accordance with Hazard Assessment Procedure, select means and methods to effectively control the risk, and train the employee in the effective execution of these controls before work begins and when changes occur that may increase the risk to the employee.

The hazard assessment must be documented and made readily available to the affected employee(s) and supervisor(s) in accordance Hazard Assessment Procedure.

### 4. Procedures

#### Radio Frequency Waves from Antennae

If there are active radio frequency (RF) carriers at the workplace, it will be considered an active RF workplace.

The supervisor is responsible for determining if the workplace is active or non-active. At a minimum, RF assessments must be performed as follows:

- Upon each arrival to the workplace and assigned work location.
- Upon powering down antennas.
- For continuous monitoring for tower climbers.
- Upon completion of work.
- During RF lockout/tagout practices.

RF assessments must be reviewed with employees prior to the commencement of work.

If supervisor is uncertain whether the workplace is active, he or she will not enter the workplace until discussing the workplace situation with the site Safety Representative and or Site Manager.

# ABM Technical Addendum

## Radio Frequency Wave Program



Supervisors must immediately notify Site Management if engineering and work practice controls are not sufficient to mitigate employees' exposure to RF, requiring them to wear an RF suit to perform their work. All employees involved with installation, maintenance, workplace acquisition, or walking the RF workplace (cell, paging, or any other RF exposure hazard) must comply with the following guidelines:

- Attend RF awareness class.
- Use the appropriate PPE.
- Wear an RF monitor while at the workplace.
- Update RF awareness class annually.

Barricades and signs must be erected and posted in areas that exceed the maximum permissible exposure limit in order to alert employees of the hazard.

### **Monitoring Exposure**

At a minimum, each employee must be equipped and trained in the use of an RF personal protective monitor. RF personal protective monitors must be the appropriate type and frequency range to alert employees to the hazards in the workplace.

ABM must ensure that employees are provided an RF monitor when working in affected locations. RF monitors must be calibrated every third year, or in accordance with manufacturer's specifications. RF monitors must include a calibration certification.

The following policies provide maximum workplace RF emission protection for all employees and allow for a single monitor at ground level if conditions warrant:

- **Rooftops**--On active RF rooftops, all employees must be required to have and use an individual RF monitor while on the rooftop.
- **Towers**--On active RF towers, all climbers must be required to have and use an individual RF monitor while on the tower.
- **Ground Sites**--On active ground level workplaces, the following must be accomplished before using a single monitor for all ground level operations employees:
  - Hazard assessments must be made daily, periodically, and as conditions change to determine workplace ground level RF readings.
  - Findings must be documented.
  - If it is determined that no RF hazard is present, a single monitor under the control of a qualified employee may be assigned for the entire ground level crew. If RF levels are in excess of the RF standard, workplace RF monitor procedures must be reevaluated and adjusted to provide adequate protection.

# ABM Technical Addendum

## Radio Frequency Wave Program



### Exposure Mitigation Measures

At a minimum, the following hazard mitigation measures must be met:

- Obey all posted signs.
- Assume all antennas are active.
- Notify the service carrier and tower clients and disable appropriate transmitters.
- Maintain a minimum 3 foot clearance from all active RF sources.
- Secure the workplace to prevent unauthorized entry.
- Allow only qualified employees into the workplace.
- Utilize lockout/tagout procedures to control power levels on transmitters.
- Do not stop in front of antennas.
- Do not operate transmitters without shields during normal operation.
- Do not operate base station antennas in equipment room.

### 5. PPE Usage

The use of PPE, such as an RF suit, must be the last resort in performing work in which RF levels exceed the maximum permissible exposure limits. Engineering and work practice controls must be established to mitigate the hazard prior to having employees outfitted in PPE to perform work in areas that exceed the maximum permissible exposure limit.

### 6. Construction in an Energized Work Environment Including RF

#### Written Safety Plan

A written safety plan is required for all electrical service affecting work to be performed on any RF feed line system component and equipment.

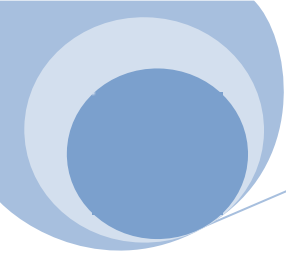
The plan must consist of the following:

- Annotated drawings showing isolation boundaries.
- A list of actions, or another form that clearly identifies the safe work requirements.
- A list of telephone contacts.
- A list of active sectors that must be shut down.

Client imposed requirements for an approved method of procedure (MOP) for electrical service affecting work must satisfy the previously mentioned requirements for a written safety plan.

Personal RF monitor requirements must be identified. Use of these devices is recommended whenever possible and is mandatory where existing RF systems may be energized. Use of a personal RF monitor is not a substitute for a planned test program to verify that energy sources are shut down.

Use of voltage monitoring equipment is recommended whenever UPS and battery systems are installed and energized.



# ABM Technical Addendum

## Radio Frequency Wave Program



### RF Feed line Isolation Criteria

Actively transmitting RF feed lines and RF system equipment must be powered off whenever possible. Verbal verification must be made that the transmitter at the workplace has been taken out of service or that it will continue to operate in specific sectors, and the cutover must be made in the operating energized condition. Clearly defined status must be received from the Network Operations Control Center (Operator) or equipment provider responsible for energizing the system. These issues are to be defined in the formal plan.

Insulating covers must be installed on all coaxial connections that are exposed and ready for connection or reconnection. This includes the jumper, feed line, equipment ports, and antenna leads.

Prior to breaking any connections at the antenna or any other location on transmit or receive RF feed lines, positive identification must be made that the correct feed line is being worked. Once identified, transmit lines and dual-purpose transmit and receive lines must be marked with tags containing the label "Danger Do Not Operate." Receive lines must be marked with tags containing the label "Caution, Restricted Operation."

### 7. Training

Supervisors and employees must be trained in RF awareness prior to commencing work where the potential for exposure to RF waves exists.

If employees are working in areas where they are required to wear RF PPE, then training on the use of specialized PPE must be provided on the selection, use, maintenance, and limitations of the PPE.

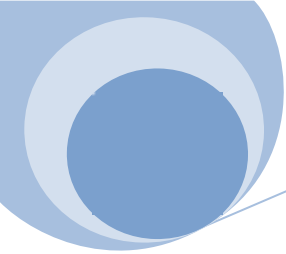
### 8. Recordkeeping

RF Awareness Training Certifications documentation is to be held and stored with all employee safety training documentation and will be available for audit upon request.

### 9. Records, Permits, Forms, and Checklists

Keep ongoing list of all records, permits, forms, checklists using following table. Hyperlink records, permits, forms, checklists to source document. Specifically identify those management reports that must be tied into a higher level governance document.

| Title  | Description |
|--|-------------|
| <a href="#">Safety Task Assignment (STA)</a> |             |
|  |             |
|  |             |
|  |             |



# ABM Technical Addendum

## Radio Frequency Wave Program



### 10. Submittals

Keep ongoing list of all submittals. Specifically identify those management reports that must be tied into a higher level governance document

| Name | From | To | When must it be submitted | Description |
|------|------|----|---------------------------|-------------|
|      |      |    |                           |             |
|      |      |    |                           |             |
|      |      |    |                           |             |

### 11. Promulgation

Each ABM location must review these procedures, reaffirm on a periodic basis, and incorporate the applicable recommendations into the operating instructions that govern work in their respective businesses. Structured communications programs, including notifications of revised or new implementing policies and procedures and, if warranted, training sessions relative to the adopted recommendations must be implemented. These communications programs must ensure thorough understanding of the requirements and effective and timely implementation.

Procedures that include the word “shall”, “will” or “must” represent mandatory implementation actions or conduct. Procedures that include the word “should” or “may” represent actions or conduct that is broadly viewed as prudent and consistent with contemporary business practices and must be implemented as applicable by business or support units.

### 12. Ownership

The owner of this procedure is the Director of ESH&S. Comments and suggested improvements to this procedure must be forwarded to the Procedure owner.