HEALTH & SAFETY PROGRAMS

MARCH 31, 2020

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Accident Investigation

Scope
This program covers the basic requirements for reporting and investigating work related accidents and incidents.

Purpose
The purpose of this program is establishing procedures and assigns responsibilities for reporting and investigating work related accidents. These procedures may vary according to the size, type and staffing of the site or event.

Definitions

- ***Accident* -** The word accident is a broad term covering a wide variety of events including, but not limited to, personal injuries and occupational illness (i.e., chemical exposures, cumulative trauma, etc.).
- ***Immediately* -** Means as soon as practically possible for a serious injury or illness including inpatient Hospitalization including the loss of any body part or any serious degree of permanent disfigurement.
- ***Incident* -** The word "incident" is a broad term covering a wide variety of events including but not limited to, fires, chemical spills and releases, unusual odors, property damage, personal injuries etc.
- ***OSHA* -** Occupational Safety and Health Administration.

General Requirements
The TCF Center Detroit will establish Accident Investigation procedures and improve operational procedures through the use of this document. Preventing future workplace injuries in our buildings is the principle purpose of Accident Investigation. This document will provide a basis for studying and recording the reasons or the root cause of an accident and why it occurred.

Including and identifying existing or potential job hazards (both safety and health) and determining the best course of action to take to reduce or eliminate these hazards.

Accident Investigation and Assessment Team

The Accident Investigation Team will include the following employees:

- General Manager
- Director of Operations
- Department Manager
- Safety / Security Manager
- Director of Human Resources
- Union Committee representative (when applicable)
- Manager of Engineering Services
- Supervisor of injured employee
- Injured employee (where possible)

Accident Investigation

Accident investigation is primarily a fact-finding procedure; the facts revealed are used to prevent recurrences of similar accidents. The focus of accident investigation will be to prevent future accidents and injuries to increase the safety and health of all our employees.

Procedures

a) Ensure any injured person receives proper care by calling Security and reporting any injured employees.
b) Ensure co-workers and personnel working with similar equipment or in similar jobs are aware of the situation. This is to ensure that procedural problems or defects in certain models of equipment do not exist.
c) Start the investigation promptly.

Accident and Incident Reporting

The TCF Center Detroit hazard reporting process will be used by all employees to report potential or known hazards. The person reporting hazard should:

a) Call into the Security Department and report the hazard.
b) Security will notify the department supervisor of the hazard.
c) The responsible department will accomplish a lockout/tag-out if required on the equipment.

Employee Responsibilities

Supervisors

The supervisor's primary responsibilities when an accident occurs are as follows:

a) Call the Security Department and report the accident or incident immediately.

b) See that the employee receives prompt medical treatment and/or first aid, as necessary.
c) Assist in the arrangement of transportation to a medical facility for the injured employee when necessary.
d) On the same day (within 24 hours) of the accident or incident, complete the Accident Report or Witness Statements on the facts of the accident to the Human Resource Department.
e) Takes the necessary follow up action to prevent recurrence of accidents.
f) Complete and attach a first report of injury report form to the incident report and forward it to Human Resources within 24 hours.

Supervisor of injured employee should:

a) Notify all affected workers of hazard.
b) Notify maintenance of hazard, if required.
c) Ensure hazard is properly marked and controlled.
d) Contact Safety / Security Manager.
e) Ensure an incident report is completed through the Security Department.
f) Complete a first report of injury Attach to the incident report and forward it to Human Resources within 24 hours.

Employees

Any employee involved in a work-related accident has the following basic responsibilities:

a) Report the incident at once to his or her supervisor.
b) Complete any necessary reports or Witness Statement.
c) Complete cooperation in any investigation that may follow the accident or incident is required.
d) Receive medical treatment if injured.
e) Obtain a doctor release report for your treatment to return to full duty or instructions if modified duties are required.

Director of Human Resources

When an accident occurs, the Human Resource Manager will have the following responsibilities:

a) Assist management and supervision in investigating the cause(s) of the accident or incident.
b) Assist in making appropriate recommendations to prevent a recurrence of the accident.
c) To report serious accidents, when required to UT-OSHA Office.

Reporting Work related fatalities, serious injuries, and imminent danger situations to the Michigan OSHA Office

Michigan Occupational Safety and Health Administration

PO Box 30643
Lansing, Michigan 48909-8143

If an incident occurs where there is a fatality or 3 or more employees are hospitalized from the same accident within an 8 hour period the Director of Human Resources will report the incident to the Michigan OSHA Office: All work-related fatalities must be reported within eight hours to the fatality MIOSHA line: 800-858-0397.

Michigan Occupational Safety and Health Administration
PO Box 30643
Lansing, Michigan 48909-8143

If there is no answer, leave a message and you will be contacted during business hours.

Preliminary Report

The Director of Human Resources should ensure the OSHA Forms 300 and 301 are filled out. These forms will be used to gather data to determine causes and corrective actions.

The OSHA Form 301 Injury and Illness Incident Report is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the OSHA Form 300 Log of Work-Related Injuries and Illnesses and the accompanying Summary. These forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out OSHA Form 301 or an equivalent. Some state Workers' Compensation, Insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on the OSHA Form 301.

According to 29 CFR 1904, OSHA's recordkeeping rule, you must keep the OSHA Forms 301 / 300 on file for 5 years following the year to which it pertains.

As a minimum the form will contain the following areas of concern:

- Injured employee's name
- Date and time of injury
- Occupation or task being performed when injured
- Shift and department
- Employee's address
- Sex/age/DOB
- Length of service
- Length of time at specific job
- Time shift started
- Physician's and hospital name (if transported)

- Type of injury
- Description and analysis of accident
- Complete accident tree
- Action taken to prevent recurrence
- Employee's statements
- Witnesses' statements
- Employer's statements
- The person completing the form and date
- Person(s) reviewing form and date

Workers' Compensation Requirements

When an accident is reported, the Director of Human Resources will have the following responsibilities:

a) Files the necessary Workers' Compensation reports and works with the Payroll Department, as necessary.

b) Contact and work with the insurance company claim adjuster or administrator.

c) Cooperates in investigating the cause of the accident.

d) Follows the medical progress of the worker with the treating physician, including return to work dates and light duty assignments when necessary.

e) Advises the supervisor of any physical limitations, modification, or restriction the employee may have upon returning to work.

f) With the injured employee's best interests in mind, it is required to have the injured employee return to work as soon as the attending physician releases them to modify / full duty.

g) Provide the injured employee with the appropriate Workers' Compensation forms as required by the State of Michigan Workers' Compensation Laws.

h) Maintains and posts required government postings and records (OSHA 300 Log) on reported injuries and illnesses.

i) The OSHA 300A Log will be posted on all appropriate bulletin boards from February 1st to April 30th of each year.

Medical Management

The Director of Human Resources will manage the program. Employees of each work shift should have access to health care providers or designated alternates in order to facilitate treatment, surveillance activities, and recording of information. During accident investigation the medical management program will as a minimum address the following issues: Injury and illness recordkeeping.

- Early recognition of problems such as strains and muscle fatigue that could lead to accidents.
- Systematic evaluation and referral.
- Conservative treatment after an accident.
- Conservative returns to work after an accident.

- Systematic monitoring.
- Record ability criteria. The accident must be work related. Simply stated unless the illness was caused solely by a non-work-related event or exposure off-premises the case is presumed to be work related.
- Occupational injuries. Injuries are caused by instantaneous events in the work environment. To keep recordkeeping determinations as simple and equitable as possible, back cases are classified as injuries even though some back conditions may be triggered by an instantaneous event and others develop as a result of repeated trauma.
- Any occupational injury involving medical treatment, loss of consciousness, restriction of work or motion is to be recorded on the OSHA-300A form.

Assessment and Review

All Accident Investigation Reports will be reviewed by a member of management responsible for the department involved to ensure pertinent information in transmitted to all concerned and remedial action(s) taken.

The Accident Assessment and Review Team will include the following employees:

- Director of Operations or Designee
- Department Manager
- Safety Manager
- Director of Human Resources
- Union Committee representative (when applicable)
- Facility Engineer
- Supervisor of injured employee

Final Report (Incident Report)

The final report will include but is not limited to the following:

- Investigation report form and pertinent data
- Photographs/drawings/exhibits of the scene
- Narrative of accident
- Witness Statements
- Sequence of events
- Contributing information
- Findings and recommendations of review team
- Action items and completion dates
- Responsible persons
- Follow-up procedures to ensure completion
- Distribution list
- Police reports case numbers (if applicable)

Job Hazard Analysis (JHA)

The TCF Center Detroit will identify the jobs that place employees at risk. After any accident or near miss the task or job in question will have a Job Hazard Analyses (JHA) and/or Workstation Analysis routinely performed by a qualified person(s) of the Accident Review Team. This analysis will help to verify that all required actions are being taken to determine if risk factors for a work position or station have been reduced or eliminated to the maximum extent feasible.

The following job positions are qualified to perform Job Hazard Analysis and/or Workstation Analysis:

- General Manager
- Directors
- Department Managers

Administrative Controls

Once data has been gathered from the Accident Investigation Report, company administrative controls will be used where needed to eliminate or reduce the frequency and severity of accidents and near misses.

Examples of administrative controls include the following:

- Increasing the number of employees assigned to a task to alleviate severe conditions, especially in lifting heavy objects.
- Providing sufficient numbers of standby/relief personnel to compensate for foreseeable upset conditions on the line.
- Job enlargement- Having employees perform broader functions which reduce the stress on specific muscle groups while performing individual tasks.
- Machine maintenance/guarding- Ensure regular maintenance is performed on machines/tools used by employees are properly guarded and that maintenance is routinely performed.
- Employee training- Ensure all employees are properly trained in the hazards associated with the job before work is performed unsupervised.
- Utilizing department and job specific Job Safety Analysis (JSA) to ensure the proper safety procedures and PPE are used when conducting a job function.

Aerial Lifts

PURPOSE

The purpose of this program is to ensure that the lifts used at TCF Center are operated, maintained, and utilized in a safe manner and therefore in accordance with applicable **OSHA regulations** and the **manufacturer's requirements**. Aerial lifts are commonly used for events, repairs, construction, and inspections to lift AASMG employees to an elevated work position. Proper operation and use of aerial lifts can make completion of tasks at elevation, safer and more efficient.

However, unsafe operation and aerial lift work practices can result in serious injury. This program has been developed due to the hazards associated with improper use and AASMG's concern for the safety of individuals in and around this type of equipment. In addition, this program outlines general, operating, maintenance, inspection, and training requirements for safe aerial lift use at TCF Center.

AASMG Venues using aerial lifts must ensure that managers, supervisors, and operators comply with all aspects of this safety program. All AASMG employees must successfully complete a training program and receive TCF Center certification prior to the operation of any aerial lift. Contractor's operating aerial lifts on AASMG projects are expected to meet or exceed the requirements found in this program and comply with all applicable statues and regulations governing the use of aerial lifts.

REQUIREMENTS

- OSHA Standard 29 CFR 1910.68 (Powered Platforms, Manlifts, and Vehicle-Mounted Work Platform)
- OSHA Standard 29 CFR 1926.453 (Aerial Lifts)
- ANSI/SIA A92.6 – 2006 (Self-Propelled Elevated Work Platforms)
- AASMG Best Practice 2.02.16.07 Man-lift and High-lift

SCOPE

This program applies to the operation of all aerial lifts operated by AASMG employees. Please see Illustration of Specific Aerial Lifts for examples. Please list below the types of lifts used at TCF Center and operated by AASMG employees.

Identification of Lift(s) in Use:

Genie — Z30/20 NRJ -- Serial # Z30N13-14234

Genie — GR20 –Serial # GR13-25429

Genie — GS26/32 – Serial # GS3213A-113811

JLG — M600JP — Serial # 0300137278

Skyjak — SJ3220 – Serial # 601-611

RESPONSIBILITIES

Managers

- Must implement and administer the Aerial Lift Safety program.
- Annually review and update the Aerial Lift Safety Program, as necessary.
    - Review the Aerial Lift Safety program for compliance and effectiveness.
- Provide the general safety training requirements for program in accordance with manufacturers recommendations.
- Monitor the effectiveness of program by receipt of copies of inspection checklists.
- Evaluate designated areas for aerial lift use.
- Define appropriate eyewash facilities for battery changing/charging areas.
- Periodically observe the operation of aerial lifts, and report unsafe practices to the appropriate supervisor.
- Maintain written records of operator training on each model of aerial lift and the name of the trainer.
- Maintain written records of all inspections performed on the aerial lift, including the date any problems found, the date when fixed, and the name of the person performing the repairs.
- Maintain written purchasing records of each aerial lift.

Supervisors

- Coordinate employee training, and proof of certification by TCF Center that all operators receive annual training.
- Ensure that only trained and qualified individuals use aerial lifts.
- Verify that all employees who operate or work near aerial lifts are properly trained. Also, verify employee compliance with the principles and practices outlined in this Aerial Lift Safety Program.
- Provide specific operational training for each aerial lift in accordance with manufacturers operating manual.
- Observe the operation of aerial lifts, and correct unsafe practices.

Aerial Lift Operators

- Read and understand the TCF Center Aerial Lift Safety Program.
    - At least annually review the procedures in this document.
    - Make recommendations for revisions if necessary, to the TCF Center Aerial Lift Safety Program.
- Complete the TCF Center Daily Pre-Use Inspection Checklist before operating any aerial lift.
    - Report any unsafe aerial lift operating conditions to your supervisor.
- Ensure any and all alarms and horns are loud enough to be heard while the machine is operating.
- Always wear fall protection harnesses when operating a lift, including a body harness & shock-absorbing lanyard.
- Know the requirement for “Line-of-Site” when operating the lift.

AERIAL LIFT PROCEDURES

Pre-Use Inspection

- Prior to the operation of any aerial lift the Pre-Use Inspection Checklist as recommended by manufacturer must be completed. This applies at the beginning of every work period, and whenever a new equipment operator takes control of the aerial lift.

- Any safety defects must be reported for immediate repair. They must also be locked and tagged and taken out of service.

GENERAL SAFE WORK PRACTICES

- Operators shall not wear any loose clothing or any accessory that can catch in moving parts.
- Before machine is started, the operator must walk completely around the machine to ensure everyone and everything is clear of the machine.
- Articulating boom and extendable boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

Modifications and additions that may affect the capacity or safe operation of an aerial/scissor lift are **strictly prohibited** without the manufacturer's written approval. Capacity, operation, and maintenance instruction markings will be changed as necessary if the manufacturer approves a modification.

- The insulated portion (if applicable) of an aerial / scissor lift shall not be altered in any manner that might reduce its insulating value.
- Any signs, plates, or decals which are missing or illegible must be replaced.
- If the aerial / scissor lift becomes disabled, a "out of service" tag or equivalent shall be attached to the controls inside the platform in a conspicuous location.
- Aerial/scissor lift devices with noted, reported deficiencies shall not be operated until repairs are made and equipment is authorized for use.

Operators must report all accidents, regardless of fault and severity, to their supervisor.

SAFE WORK PRACTICES BEFORE OPERATION

- Consideration shall be given to the amount of wind. Follow the manufacturer's instruction regarding operation in windy conditions. As a general rule aerial lifts shall not be operated in winds exceeding 25mph although this can vary depending on the model of equipment
    - At 20mph wind speeds or anticipated gusts, lifts will be lowered to a maximum height of 20 feet.
    - At 25mph wind speeds or anticipated gusts, lifts will be grounded.
    - If at any time, an AASMG employee feels unsafe in lifts, they may make decision to ground the lifts.
- Guardrails must be installed, and access gates or openings must be closed before raising the platform.
- Boom and platform load limits specified by the manufacturer shall not be exceeded.
- Before moving an aerial lift for travel, the boom(s) shall be inspected to see that it is properly cradled, and outriggers are in stowed position (if equipped).

- Consideration shall be given to the protection of bystanders via barricading, having another employee keep bystanders at a safe distance or by other means.
- Aerial lifts shall not be operated from trucks, scaffolds, or similar equipment.

SAFE OPERATION

Attention shall be given towards the direction of travel, clearances above, below and on all sides.

- Employees shall not sit or climb on the guardrails of the aerial lift.
- Planks, ladders, or other devices shall not be used on the work platform.
- An aerial lift shall not be moved when the boom is elevated in a working position with employees in the basket.
- Aerial lift shall not be placed against another object to steady the elevated platform.
- Aerial lift shall not be used as a crane or other lifting device.
- Aerial lift devices shall not be operated on grades, side slopes or ramps that exceed the manufacturer's recommendations.
- The brakes shall be set and outriggers, when used, shall be positioned on pads or a solid surface.
- Speed of aerial lift devices shall be limited according to the conditions of the ground surface, congestion, visibility, slope, location of personnel and other factors that may cause hazards to other nearby personnel.
- Stunt driving and horseplay shall not be permitted.
- Booms and elevated platform devices shall not be positioned in an attempt to jack the wheels off the ground.
- The area surrounding the elevated platform shall be cleared of personnel and equipment prior to lowering the elevated platform.
- All equipment must be secured on the inside of the aerial lift
- Operators are to call for assistance if the platform or any part of the machine becomes entangled.

SAFE WORK PRACTICES AFTER OPERATION

Safe shutdown shall be achieved by utilizing a suitable parking area, placing the platform in the stowed position, placing controls in neutral, idling engine for gradual cooling, turning off electrical power, and taking the necessary steps to prevent unauthorized use.

Aerial lifts shall be shut off prior to fueling. Fueling must be completed in well ventilated areas free of flames, sparks or other hazards which may cause fires or explosions.

CHANGING AND CHARGING BATTERIES

- Battery charging installations must be located in areas designated for that purpose
- Facilities must provide for: flushing and neutralizing spilled electrolyte, fire protection, protection of charging apparatus from damage by trucks, adequate ventilation for dispersal of fumes from gassing batteries.
    - Precautions must be taken to prevent open flames, sparks, or electric arcs in battery charging areas.

- Employees charging and changing batteries shall be authorized to do the work, trained in the proper handling, and required to wear protective clothing, including face shields, long sleeves, rubber boots, aprons, and gloves.

MAINTENANCE

- Any aerial lift not in safe operating condition must be removed from service. Authorized personnel must make all repairs.
- Repairs to the fuel and ignition systems of aerial lifts that involve fire hazards must be conducted only in locations designated for such repairs.
- Aerial lifts in need of repairs to the electrical system must have the battery disconnected before such repairs.
- Only use replacement parts that are currently recommended by the manufacturer.

TRAINING REQUIREMENTS

Employees who are authorized to operate aerial lifts must receive training prior to engaging in their duties, and at least annually as required by AASMG. The training is to ensure that the Aerial Lift Safety Program is understood. The manager and direct supervisors will also ensure that authorized aerial lift operators have acquired the necessary practical skills required for safe operation.

TCF Center will ensure managers and/or supervisors perform an operational training with each employee to determine if operators have the knowledge, training, and skills necessary to use the aerial lift. Operational training will consist of a combination of general safety instruction, practical/operational training (demonstrations performed by the trainer, and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace. All operational training must be conducted under close supervision and in accordance with manufacturers operating manual requirements.

INITIAL TRAINING

- Prior to operating any Aerial Lift the trainee will read and understand the manufacturer's operating instruction(s) and aerial lift procedures, receive training by a qualified person on the contents of the manufacturer's operating instruction(s) and users safety rules.
- Be informed of the Aerial Lift operating limitations and restrictions as defined by the manufacturer.
- Receive instruction on the intended purpose and function of each control.
- Understand by reading or having a qualified person explain all decals, warnings, and instructions displayed on the Aerial Lift.
- During operational training, trainees may operate an aerial lift only under the direct supervision of authorized trainers, and where such operation does not endanger the trainee or other employees.
- All training and evaluation must be completed before an operator is permitted to use an aerial lift without continual and close supervision.

AASMG REQUIRED ANNUAL TRAINING – MUST INCLUDE AT LEAST THE FOLLOWING

- Review of the Aerial Lift Inspection & Maintenance Records
- Operator Review of TCF Center Aerial Lift Program and Manufacturer Safety Precautions.
- Updated information on new equipment.

TRAINING RECORDS

- Each department must maintain a record of all individual training.

DATE OF TRAINING

- Printed name of individual trained with signature and date.
- Name of individual providing the training.
- Training records must be maintained in accordance with AASMG Best Practice 2.0 Occupational Safety and Health Program.

PROGRAM EVALUATION

The TCF Center aerial lift program shall be evaluated on an annual basis to ensure compliance with set forth by Federal, State, and Local Occupational Health and Safety Agencies.

Any deficiencies determined in the program will be documented and corrective action plans will be developed for implementation by TCF Center.

Asbestos (ACM)

This Best Practice applies to all AASMG managed venues that may contain asbestos-containing materials (ACM) and provides basic information on the steps required to create and implement an Asbestos O&M.

TCF Center ***(Hereinafter referred to as "TCF")*** is committed to providing a safe and healthful work environment for the TCF Center community of staff, vendors, visitors, and external contractors and consultants on site. In pursuit of this goal, the following asbestos exposure control plan ***(Hereinafter referred to as "ECP")*** is provided to eliminate or minimize occupational exposure to Asbestos Containing Materials ***(Hereinafter referred to as "ACM")*** in accordance with MIOSHA Part 602 "Asbestos Standard for Construction" Standard. Copy is available for review on request.

The ECP is a key document to assist TCF Center in implementing and ensuring compliance with the standard, thereby protecting our employees and vendors.

Contact Information

For Program Information and Asbestos Building Management:
TCF Center Building Engineering Department ***(Hereinafter referred to as "TCFBE")***
2nd Floor Administration Office
1 Washington Boulevard
Detroit, MI 48226
Telephone: 313.877.8288
Mr. Al Vasquez, Manager Engineering Services
APM – Asbestos Program Manager
(Hereinafter referred to as "APM")

For Asbestos Emergencies:
Contact your supervisor who will in turn contact TCFBE and APM

Purpose

The purpose of this program is to summarize TCF Center's asbestos management procedures for the TCF Center community of staff, vendors, visitors, and external contractors and consultants on site. The goal of a management plan is to prevent the release of asbestos fibers until the asbestos-containing material (ACM) in the building is scheduled to be professionally removed in advance of maintenance, renovation, or demolition activities. This plan outlines the TCF Center's procedures and best practices regarding the day-to-day management of asbestos and the planned or accidental disturbance of asbestos. This program is not a substitute for proper asbestos training and is not a complete reference for asbestos information. Please consult the "Applicable Regulations" section within this management plan or contact the Asbestos Program Manager for more information.

Introduction

Asbestos is a general name for a group of naturally occurring minerals composed of small fibers. These fibers are very strong and resistant to heat and chemicals. Asbestos is common in many materials used in buildings constructed prior to 1980, and was added to many older building materials including spray-on fireproofing, floor tiles, ceiling tiles, insulation on pipes and ducts, acoustical and decorative coatings, and roofing materials. These types of building materials are presumed to contain asbestos unless testing has proven otherwise. TCF Center has portions of the building that was constructed before 1980.

Sample List of Asbestos Containing Materials

The following is a list of known ACMs from TCF Center building surveys and is intended to show the types of materials that have been found to contain asbestos. Each area of is different and the list below is NOT exhaustive. For building specific information see TCF Center's complete Hazardous Materials Management plan as prepared by ETC Group dated May 1, 2012 and the building assessment surveys as prepared by SME:

TCF Center Hazardous Materials Assessment dated April 12, 2011 – Arena & Parking Garage
TCF Center Hazardous Materials Assessment dated August 5, 2011 - All areas of TCF Center – Except Arena & Parking Garage

Questions regarding building surveys or specific material should be directed to TCFBE / APM.

Following data excerpted from SME Hazardous Materials Assessment dated August 5, 2011 Section 3. "Findings & Recommendations". To review the complete survey, contact TCFBE / APM.

The reported analytical sample results indicated 18 types of thermal system insulation (TSI), seven types of surfacing materials, 14 types of floor tile and/or associated mastics, and three types of miscellaneous materials contained greater than I% asbestos, and as such, are considered ACMs. The following is a discussion of each type of ACM encountered and recommendations relative to the proposed demolition activities.

Thermal System Insulation (TSI) and Surfacing Materials

The reported analytical results of TSI and surfacing material samples collected during SME's assessment indicated asbestos-containing TSI and surfacing materials are present throughout TCF Center. The PLM analytical data identified the following TSI and surfacing materials as ACMs:

- Steam supply pipe system mudded fitting/elbow/tee insulation (All floors).
- Condensate return pipe system mudded fitting/elbow/tee insulation (All floors).
- Chilled water pipe system mudded fitting/elbow/tee insulation (All floors).
- Cold water supply pipe system mudded fitting/elbow/tee insulation (All floors).
- Hot water supply pipe system mudded fitting/elbow/tee insulation (All floors).
- Hot water return pipe system mudded fitting/elbow/tee insulation (All floors).
- Sanitary pipe system mudded fitting/elbow/tee insulation (All floors)
- Compressor pipe system straight insulation with black tar wrap (Ground Floor)
- Compressor pipe system mudded fitting/elbow/tee insulation (Ground Floor)
- White tape of duct insulation (Ground Floor)
- Cork board duct insulation with black tar (tar only) (Ground Floor)
- Abandoned steam supply system straight magnesia insulation (First floor)
- Abandoned steam supply system mudded fitting/elbow/tee insulation (First floor)
- White HVAC duct insulation with canvas wrap (Third floor)
- Steam compressor tank insulation (Third floor)
- White textured fireproofing surfacing material (Ground floor)
- Brown/grey spray-applied fireproofing on metal decks and structural beams (Ground floor)
- Soft white spray-applied acoustical/decorative surfacing material (First floor)
- Hard white spray-applied acoustical/decorative surfacing material (First floor)
- Plaster ceiling surfacing (Ground Floor)
- Black surfacing mastic (First floor)
- Soft, grey spray-applied fireproofing surfacing material (Third floor)

Samples of the TSl from each of the pipe systems, tank insulation, and surfacing materials noted above were found to contain greater than I% asbestos and, as such, are considered ACMs. With the exception of the nonfriable surfacing mastic, tar wraps and canvass wraps, the listed materials are considered friable ACMs, and have the potential to release asbestos fibers if disturbed or improperly removed.

TSI on Pipe Systems Observations

In general, the TSI systems were designated by color depending on their mechanical function. SME observed the following color designations on all floors:

- Orange- Steam supply system (ACM fittings)
- Grey- Condensate return system (ACM fittings)
- Grey and/or light blue- Cold water supply system (ACM fittings)
- Medium blue- Hot water return system (ACM fittings)
- Dark blue- Hot water supply system (ACM fittings)

- Brown- Chilled water supply and return (ACM fittings, supply only)
- Green- Compressor system (ACM fittings and straights)
- No color (cream canvas) or grey- Sanitary system (storm and sewer) (ACM fittings)
- No color (cream canvas) or grey- HVAC duct insulation (ACM insulation)

SME noted the presence of the ACM pipe insulation on the systems noted above in mechanical rooms, above suspended ceilings, ceiling spaces, and interstitial wall chases on all floors of TCF Center. With the exception of the white magnesia insulation on an abandoned steam system on Floor 2, the pipe system straights were primarily wrapped in non-ACM fibrous glass insulation with a canvass and/or black tar wrapping. With the exception of the compressor system, the canvass and tar wrap on all other pipe systems were reported as non-ACM. The abandoned steam pipe system with white asbestos magnesia straight insulation was noted above the plaster ceiling in the west hallway of the First Floor. SME observed approximately 15 linear feet of the ACM straight insulation on the compressor pipe system in mechanical room R134 on the Ground Floor.

SME observed approximately 22,000 pipe fittings and pipe hangers insulated with asbestos on the mechanical systems noted above on all floors. Remaining insulated fittings on the pipe systems appeared to be plastic wrapped fittings and joints with fibrous glass insulation.

SME observed approximately 622,000 square feet of the ACM white duct insulation located on the ceilings within the Halls and mechanical rooms of Floor 3 and adjoining freight elevators 9110 on Floor 2. SME observed approximately I, 000 square feet of the cork board duct insulation with the ACM black tar within the walk-in cooler located in the Edgewater Room on the Ground Floor. SME noted the presence of approximately 150 square feet of the ACM white fibrous tape along the perimeter of HVAC ducts above suspended ceilings of the East Hallway of the Ground Floor. SME observed approximately 400 square feet of the ACM steam compressor tank insulation in the mechanical room adjoining mechanical room 45M in the South Hallway of Floor 3.

Surfacing Material Observations

Surfacing materials were observed on structural beams, metal/concrete decks, and plaster ceilings on all floors of TCF Center. Based on appearance during the assessment, the surfacing materials appeared to be applied by a spray-on or trowel-on application as a type of fireproofing insulation or acoustical and/or decorative purposes. Based on analytical results, six types of ACM textured surfacing materials were identified on the Ground Floor, First Floor, and Third Floor. The remaining surfacing materials were identified as non-ACM.

SME observed approximately 130,000 square feet of the ACM brown/grey spray-applied fire proofing surfacing material on metal/concrete decks and structural beams throughout the Ground Floor. Please note, the ACM brown/grey textured surfacing on metal/concrete decks and structural beams appeared similar in application and texture as the brown textured surfacing on Floors I through 3. However, analytical results of the brown textured surfacing on Floors I through 3 indicated the material is non-ACM. SME noted the presence of approximately 1,300 square feet of the ACM white textured surfacing on plaster ceiling within the control room of the Ground Floor and 800 square feet of the ACM white textured surfacing on the plaster ceiling above suspended ceiling tiles in the southern portion of the Main Concourse of the First Floor. SME noted white surfacing debris on the top surfaces of the suspended ceiling tiles in the southern portion of the Main Concourse of the First Floor. SME observed approximately I, 500 square feet of the ACM white textured surfacing on a plaster ceiling stage within the Riverview Ballroom on the First Floor. SME noted the presence of approximately 300 square feet of the black surfacing mastic along

the west exterior wall of the parking/loading docks of the First Floor. SME observed approximately 12,600 square feet of the ACM grey textured surfacing on a metal sheet partition between Wayne and Oakland Halls.

Because the building was occupied/operational at the time of the assessment, SME conducted limited destructive assessment of interstitial spaces. However, SME did not assess every wall cavity or ceiling space within TCF Center or demolish floor surfaces. Therefore, the possibility of concealed ACMs exists in the building. If interstitial spaces such as these will be impacted by demolition or renovation activities, SME recommends selective demolition within the buildings to expose concealed spaces such as these prior to initiation of full-scale demolition or renovation activities, ideally during the asbestos abatement phase of the project, so concealed ACMs may be removed immediately following discovery.

Plaster Surfacing

SME observed plaster ceiling and plaster walls throughout TCF Center. SME assessed and sampled the plaster walls and ceiling as separate homogenous areas for each floor. Analytical results indicated one of the five plaster ceiling samples collected on the Ground Floor was asbestos containing. Therefore, the plaster ceiling on the Ground Floor is considered an ACM. SME observed approximately 36,000 square feet of the ACM plaster ceiling throughout the Ground Floor. Plaster wall samples collected on the Ground Floor along with plaster wall and ceiling samples collected on the remaining floors were reported by the laboratory as non-- ACM.

Flooring and Miscellaneous Materials

The PLM analytical data indicated samples of the following floor tiles and miscellaneous materials contained greater than I% asbestos and are considered ACMs:

- 9" x 9" tan matrix floor tile and black mastic (Ground Floor)
- 9" x 9" tan matrix with black streaks floor tile and black mastic (Ground Floor)
- 9" x 9" grey matrix with black specks floor tile and black mastic (First Floor)
- 9" x 9" grey matrix floor tile with cream streaks and black mastic (First Floor)
- 9" x 9" brown matrix floor tile and black mastic (First Floor)
- 12" x 12" brown matrix with 4" square pattern floor tile and tan mastic (floor tile only) (Ground Floor)
- 12" x 12" black matrix with grey marbling floor tile (assumed ACM) (First Floor)
- 12" x 12" tan matrix with cream specks floor tile and yellow mastic (floor tile only) (First Floor)
- 18" x 18" cream matrix with black specks floor tile and black mastic (mastic only) (Second Floor)
- 18" x 18" black matrix with cream specks floor tile and black mastic (mastic only) (First Floor)
- 18" x 18" grey matrix with black specks floor tile and tan/grey mastic (mastic only) (First Floor)
- 2” square patterned vinyl flooring and yellow mastic (vinyl flooring only) (First Floor)
- Black carpet mastic (First Floor)
- Black floor tile mastic (First Floor)
- Decorative granite styled wallboard system on columns and decorative cubes (Assumed ACM) (First Floor)
- Electrical transformer mesh wrap (assumed ACM) (Ground Floor and Third Floor)
- Fire Doors (assumed ACM) (All Floors)

According to USEPA regulations, the ACM flooring materials are considered "miscellaneous"

Category I nonfriable ACMs. The mastic, electrical mesh wrap, and wallboard systems are considered miscellaneous Category II nonfriable ACMs. The potential for an asbestos fiber release from these nonfriable ACMs is low provided these materials are not improperly removed or disturbed. SME observed approximately 4,400 square feet of ACM flooring materials and associated mastics in various locations throughout TCF Center. SME observed approximately four-square feet of the black carpet mastic in southern portion of the Main Concourse of the First Floor.

SME observed approximately 40,000 square feet of the decorative wallboard on columns throughout the Main Concourse on the First Floor. At the time of the hazardous materials assessment, the decorative wallboard could not be sampled without compromising the aesthetic appeal of the columns. Because no analytical data exists, the decorative wallboard is categorized as an "assumed" ACM.

SME noted approximately I, 000 square feet of the electrical mesh wrap on transformers located throughout TCF Center. At the time of SME's assessment, the transformers were operational, and the associated electrical wrap was inaccessible for sampling. In the absence of analytical data demonstrating asbestos content less than I%, the electrical mesh wrap it is categorized as an "assumed" ACM.

SME observed approximately 250 fire doors throughout the entrances to the Convention Halls, stairwells, and mechanical rooms on all floors. SME was unable to sample the insulation within the fire doors without destructive assessment, which would have compromised the fire rating of the doors. Based on the age of the building, SME presumes the fire doors contain asbestos insulation and the fire doors are considered "assumed" ACMs.

End of SME Excerpted TCF Center Hazardous Materials Assessment dated August 5, 2011 – "All areas of TCF Center – Except Arena & Parking Garage"

The mere presence of asbestos in a building does not mean that the health of the building occupants is endangered. When left intact and undisturbed, asbestos-containing materials do not pose a health risk to building occupants.

There is, however, potential for exposure when the material becomes damaged or disturbed. Unauthorized removal or disturbance of asbestos is not only dangerous, it is also illegal. When materials are exposed or disturbed, asbestos fibers can become airborne and pose an inhalation hazard. Studies have shown that individuals exposed to asbestos fibers over a long period of time may develop lung cancer, Asbestosis (a fibrotic scarring of the lungs), and Mesothelioma (a cancer of the lining of the chest or abdominal cavity). The typical latency periods for these diseases range from 10-40 years.

Instead of removing all asbestos containing material upon discovery, the Environmental Protection Agency (EPA) recommends an in-place management program for the existing asbestos materials. EPA only requires asbestos removal in order to prevent public exposure to asbestos, such as during building renovation or demolition. TCF Center has maintained an effective in-place management program for several years. This program ensures that the day-to-day management of the building minimizes the release of asbestos fibers into the air, and ensures that when asbestos fibers are released, either accidentally or intentionally, proper control and clean-up procedures are implemented. In order to follow this guideline, the TCF Center's management program Involves identifying existing asbestos and

maintaining it in place in good condition.

Responsibilities

TCF Center community of staff, vendors, visitors, and external contractors and consultants are expected to follow the requirements outlined in the *General Asbestos Compliance* section. In addition, in order to increase the effectiveness of this asbestos management program, the following responsibilities are specifically designated:

TCF Center Employees

1. Do not clean, damage, disturb, or remove asbestos-containing materials unless trained and authorized.
2. Contact your supervisor to have a suspect asbestos containing material identified.
3. Contact your supervisor to report suspected asbestos debris or damaged asbestos containing materials.
4. Attend appropriate initial and refresher trainings as directed by your supervisor and the TCFBE / APM.

Supervisors, Managers, Directors

1. Assure that information and procedures contained within this Asbestos Management Plan are strictly followed by all personnel.
2. Notify the APM when new employees are hired so they may be properly trained, if necessary. If a new employee will perform housekeeping activities or otherwise work around ACM or PACM, ensure they receive initial two-hour asbestos awareness training.
3. Contact the APM for testing of suspect materials encountered during routine operations.
4. Immediately contact the TCFBE / APM for clean-up/repair if an employee reports that ACM has been discovered in a damaged state or was accidentally disturbed.
5. Submit TCF Center service request to the TCFBE / APM for Asbestos if materials containing asbestos require disposal.
6. Ensure that authorized employees are following proper work procedures while handling ACM and if an NEA is relied upon that it is listed as “current” by the APM.
7. Coordinate annual air sampling with the APM to keep Negative Exposure Assessments (NEA’s) current.

Surplus Materials

1. Collect surplus PACM materials from site only after inspection and approval from the APM.
2. Do not resell any materials which may contain ACM unless specifically authorized by the APM.
3. Maintain training consistent with Class IV operations as defined in this management plan.

Design Representatives

1. Coordinate with the Asbestos Program Manager when renovations and demolitions are planned to obtain existing asbestos surveys and to determine what level of project design and specification documents may be required.
2. Ensure that funding for all environmental considerations, including abatement and environmental consultant services are accounted for in project budgets.
3. Provide the APM with a copy of all building survey and project specification information for abatement activities as they are obtained.

Construction Representatives

1. Ensure that only prequalified asbestos abatement contractors perform asbestos abatement activities.
2. Ensure proper notifications are made regarding asbestos abatement projects.
3. Stop work immediately if additional ACM or PACM materials are encountered at a work site and contact the APM for Asbestos for further sampling.

4. Notify the TCFBE / APM of any asbestos related incidents at TCF Center construction sites.
5. Assist TCFBE / APM in stopping work at abatement sites if requested.
6. If a regulatory agent requests to see an abatement work area immediately contact the TCFBE / APM to be present.
7. Provide the TCFBE / APM with a copy of all air sampling results from abatement activities as they are obtained.

External Project Managers, General Contractors, and Sub-Contractors

1. Ensure that all employees have received asbestos awareness training including information on the presence, quantity, and location of site-specific materials.
2. Do not impact ACM or PACM unless specifically trained and authorized to do so.
3. Stop work immediately and contact the assigned Construction Representative if a previously unidentified ACM or PACM is discovered.
4. Communicate hazards related to asbestos work to all other trades on a project site.
5. Engage only prequalified asbestos abatement contractors for asbestos abatement activities.

External Asbestos Abatement Contractors

1. Follow all provisions of the applicable regulations governing asbestos operations, project-specific asbestos abatement specifications, and this management plan.
2. Maintain Type-II contractor licensure from MDLARA as well as appropriate insurance coverage.
3. Use only individuals currently accredited as Asbestos Workers or Asbestos Contractor/Supervisors by MDLARA to perform asbestos abatement.
4. Receive approval from the TCFBE / APM before requesting a regulatory variance from any state agency.

External Environmental Consultants

1. Use only individuals currently accredited as Asbestos Building Inspectors by MDLARA to perform type I and type II asbestos inspections.
2. Use only individuals currently accredited as Asbestos Project Designers by MDLARA to create specifications and/or project documents for asbestos abatement activities.
3. Maintain proficient laboratory participation in the NIOSH/AIHA proficiency in analytical testing (PAT) program and/or Asbestos Analyst Registry (AAR) program.
4. All on-site personnel shall have asbestos abatement contractor/supervisor or competent person training and have satisfactorily completed a NIOSH 582 or equivalent airborne fiber counting course.
5. Ensure that asbestos abatement work is conducted in accordance with all applicable regulations, the project specific specification, and this management plan. If non-compliant work practices are observed,

the air monitoring professional shall take corrective action on-site and notify the TCFBE / APM and the appropriate
Project Representative.

6. Conduct on-site air monitoring in strict accordance with the NIOSH 7400 method or OSHA reference method, including all QA/QC provisions.

Asbestos Program Manager (APM)

1. Maintain the Asbestos Management Program and revise, as necessary.
2. Provide or coordinate necessary asbestos training for TCF Center staff.
3. Conduct asbestos identification activities.
4. Maintain records of all building surveys, material sampling, training, abatement activities, air monitoring and negative exposure assessments.
5. Provide technical review of project design and specifications for asbestos abatement on “Major” and “Minor” projects.

6. Investigate asbestos concerns of staff, contractors, building occupants, and visitors.
7. Periodically monitor activities at asbestos abatement job sites for compliance to applicable regulations.
8. Review State of Michigan project notifications.
9. Approve or deny regulatory variance requests from contractors.
10. Meet with all regulatory agencies as needed for inspections and asbestos related inquiries.
11. Maintain open contracts for Asbestos Abatement Contractors and Industrial Hygiene Consultants to facilitate the removal of ACM from site properties as needed.
12. Respond to reports of accidental disturbances for clean up or repair.

General Asbestos Compliance

The DEQ-AQD *NESHAP Standards* as well as the MIOSHA *Asbestos Standards for Construction* and *Asbestos for General Industry* apply to all individuals working on any TCF Center owned property and are incorporated by reference into this program. For further detail please see a copy of these regulations by contacting the Asbestos Program Manager. The material presented in this portion of the management plan addresses TCF Center specific requirements for asbestos related work.

Asbestos Surveys

Type I asbestos surveys have been conducted for TCF Center in compliance with the regulations set forth in the OSHA Asbestos Standards for Construction, 29 CFR 1926.1101. The purpose of these surveys is to determine the presence, location, and quantity of ACM. During the survey, representative samples of each suspect material are taken and analyzed at an accredited independent laboratory. If no sample information is available for thermal system insulation (TSI), sprayed-on or troweled-on surfacing materials, or asphalt and vinyl flooring installed before 1981, these materials must be treated as asbestos containing materials. Copies of completed surveys are maintained by TCF Center's TCFBE / APM.

When a building is scheduled for major renovation or demolition, a *Type II* survey must be conducted to comply with the requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP). The purpose of this survey is to review the findings of previous surveys and identify any deficiencies. Typical work includes identifying, sampling, and quantifying fire doors, roofing, caulks, glazing compounds and other materials previously assumed to contain asbestos. Formerly inaccessible spaces such as pipe chases, tunnels, and ceiling cavities must also be evaluated.

Training

Training is required for all employees who perform Class I through IV asbestos work. The training must meet the requirements of the EPA Model Accreditation Plan (MAP). No untrained workers are to disturb any amount of asbestos. No TCF Center employees are to disturb any amount of asbestos. TCF Center does not provide training to non- TCF Center personnel. Contact TCFBE for training details. The following are the basic training requirements for the different types of asbestos work:

Class I asbestos work involves the removal of TSI and surfacing ACM and presumed asbestos-containing material (PACM). Training for Class I work is either 32 hours (asbestos worker), or 40 hours (contractor/supervisor and function as a competent person). An annual 8-hour refresher course is required for both the worker and contractor/supervisor competent person level of training.

Class II asbestos work involves the removal of ACM which is not thermal system insulation or surfacing material. This includes the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics. Training for Class II work may be the same as for Class I work (asbestos worker or contractor/supervisor) or may be 8 hours of task specific training which

includes hands-on training. A separate 12-hour course for flooring removal that complies with the Flooring Industry Settlement Agreement is also offered. An annual refresher is required for all workers.

Class III asbestos work involves repair and maintenance operations where ACM including TSI and surfacing ACM and PACM may be disturbed. Training for Class III work is 16 hours with an annual 4-hour refresher course.

Class IV asbestos work involves maintenance and custodial activities during which employees contact but do not disturb ACM and PACM. Initial two-hour asbestos awareness training with an annual refresher is required for all custodial, maintenance, housekeeping and service personnel who work in buildings that contain asbestos. The annual refresher training is mandatory attendance.

Exposure Assessments and Monitoring

Air monitoring is conducted by an independent consulting firm during Class I-III asbestos work. This monitoring typically consists of samples from the breathing zones of employees performing the work, samples from the area surrounding the regulated area, and clearance samples after the work is completed. Additional samples will be collected at the discretion of the consulting firm or at the request of TCF Center Environmental Health and Safety personnel unless otherwise specified in this management plan or project specifications. The consulting firm will perform phase-contrast microscopy (PCM) on-site using the NIOSH 7400 Method (A Counting Rules) to ensure that airborne fiber levels are well within regulatory limits. The data regarding airborne fiber levels and worker exposure levels are maintained by the TCF Center Physical Plant and the Environmental Health and Safety Department.

Negative Exposure Assessments

A Negative Exposure Assessment is a demonstration by an employer that an employee's exposure is consistently below the Permissible Exposure Limit (PEL) and Short-Term Exposure Limit (STEL). A negative exposure assessment is job specific and the workplace conditions, type and amount of material, asbestos type and percent by weight, control methods, work practices, and environmental conditions must closely resemble those of the activity to be represented. The assessment can be used to show that exposure levels for a given job will be below the PEL so that lower levels of personal protective equipment (PPE) can be used. An NEA must rely on data collected within the previous 12 months and is not transferrable between companies.

Negative exposure assessments have been established for routine operations and maintenance (O&M) operations conducted by TCF Center employees and are maintained by the APM. The supervisor is responsible for ensuring the NEA is listed as "current" before assigning an employee to a job task which relies on that information.

Asbestos Abatement Air Monitoring

All Class I and II asbestos abatement projects must include the following air monitoring during operations regardless of current NEA status:

Task specific exposure monitoring (personal sampling) for each task and on at least 25% of the work force. Task specific 30-minute short term excursion limit (STEL) personal samples at least once per day, per task. Perimeter (clean area) sampling from areas adjacent to the restricted areas.

If negative air machines are exhausted inside the building, the exhaust must be monitored.

Final Clearance Monitoring

At the completion of all asbestos removal projects final clearance monitoring is conducted. As part of the final clearance, independent consulting firms are required to conduct a thorough post abatement visual inspection per the current version of ASTM standard E1368. After a successful visual inspection representative PCM air clearance samples with a minimum of 1200 liters of air will be collected. Aggressive final air clearances incorporating the use of a box fan and 1-hp blower motor used to agitate the air must be conducted for all negative pressure enclosure or critical barrier enclosure abatement systems. Passive final air clearances may only be used in abatement systems where a complete enclosure system was not required or used. TEM clearance sampling may be required in special circumstances (i.e. dusty environments).

While the State of Michigan requires a clearance level of 0.05 fibers per cubic centimeter of air (f/cc) in all asbestos removal projects involving more than 10 linear or 15 square feet of friable asbestos, all projects on TCF Center site must use the clearance level of 0.01 f/cc. Where TEM samples are collected an average clearance level of 70 structures per square millimeter (70 s/mm^2) must be met. If any of the requirements of the final clearance monitoring section cannot be met, a variance must be requested from the APM. This request must include the specific reasons for the variance and the proposed alternative. The APM will approve or deny this request in writing.

Respiratory Protection

All TCF Center employees must be provided with proper protective clothing and respirators when assigned to work in Class I-III asbestos work or Class IV work that takes place in a regulated area. The TCF Center maintains a respiratory protection program for its employees in accordance with MIOSHA Respiratory Protection Standard Part 451 (OSHA 29 CFR 1910.134). Contact the APM for information on the TCF Center respirator program.

Housekeeping

All surfaces shall be maintained as free as practicable of ACM waste, debris, and accompanying dust.

Surfaces contaminated with asbestos may not be cleaned using compressed air. Do not drill holes, hammer nails into, hang objects from, touch with curtains, or move furniture that damages ACM or PACM. Waste, debris, and accompanying surface dust in areas containing accessible and/or visibly deteriorated ACM, shall not be dusted, swept, shoveled dry, or vacuumed without using a HEPA filter.

All vinyl and asphalt flooring should be treated as ACM unless evidence exists to prove otherwise. The following restrictions exist for the care of ACM flooring: no sanding is permitted, stripping should be conducted using low abrasion pads at speeds lower than 300 rpm with wet methods, and burnishing or dry buffing may be performed only on flooring which has sufficient finish so the pad doesn't contact the flooring material. Broken ACM floor tiles should only be removed by properly trained personnel.

Ceiling tiles should not be moved or replaced until it is confirmed that they are not ACM. In buildings where spray-applied surfacing materials are known to exist above drop ceilings, tiles must be decontaminated before they are disturbed. Only trained personnel can replace, decontaminate, or otherwise disturb ACM ceiling tiles or tiles that may be contaminated by ACM surfacing material above.

Medical Surveillance

TCF Center maintains a medical surveillance program for all employees who are engaged in Class I-III work for a combined total of more than 30 days per year or are exposed at or above the permissible exposure limit. This medical surveillance consists of a review of medical and work history, a physical exam directed to the pulmonary and gastrointestinal systems, a chest roentgenogram interpreted by a NIOSH certified B Reader, and pulmonary function tests. This exam is offered annually at no charge to affected employees. For employees otherwise required to wear a respirator, a physician will determine that the employees are able to perform the work and use the equipment. For further information on medical surveillance, contact your supervisor.

Recordkeeping

Specific records must be kept regarding asbestos related activities, including but not limited to:

1. Signed manifests returned from the asbestos disposal facilities shall be maintained by the APM.
2. Training records, including employee name, employee ID number, job title, name of training, date(s) of training, and instructor name shall be maintained by the APM.
3. Exposure monitoring records including employee name, employee ID number, job title, and task, results of monitoring, testing protocol, and date of testing shall be maintained by the APM.
4. Medical records are kept on file by the Certified Abatement Contractors Physician's office with.
5. Other records or information as required by this management plan or existing regulations shall be maintained by the APM, as necessary.

Notifications and Communication

Building Occupants & Contractors

The following shall be notified of the presence, location, and quantity of ACM and/or PACM:

1. Prospective employers applying or bidding for work whose employees may be expected to work in or adjacent to areas containing this material.
2. Contractors hired to work in or adjacent to areas containing this material.
3. TCF Center employees who may work in or adjacent to areas containing this material as well as building occupants who may incidentally come in contact with this material.
4. Tenants who occupy TCF Center spaces containing this material.

Notification to the State of Michigan

All contractors are required to notify the Michigan Department of Environmental Quality, Air Quality Division (DEQ-AQD) if conducting demolition, regardless of the date of construction of the building. Additionally, asbestos abatement contractors are required to submit notification to the Michigan Department of Licensing and Regulatory Affairs (DLARA) and DEQ-AQD if the quantity of friable ACM being removed meets the following criteria:

DEQ-AQD (NESHAP) ***[260 linear feet, 160 square feet, 35 cubic feet or more is threshold]***

Planned Renovation – 10 **working** days' notice
Emergency Renovation
Scheduled Demolition – 10 **working** days' notice
Intentional Burn – 10 **working** days' notice
Ordered Demolition Non-Asbestos Demolition – 10 **working** days' notice

DLARA (MIOSHA) ***[>10 linear feet or 15 square feet is threshold]***

Demolition, Renovation, or Encapsulation - 10 **calendar** days' notice
Emergency Renovation/Encapsulation

The contractor submitting a notification form to DEQ-AQD or DLARA must send a copy to the Asbestos Program Manager. Notifications can be mailed to:

TCF Center Building Engineering Department
2nd Floor Administration Office
1 Washington Boulevard
Detroit, MI 48226
Telephone: 313.877.8288
Mr. Al Vasquez, Manager Engineering Services
APM – Asbestos Program Manager

In situations where a variance of work methods must be requested of either agency, prior approval must be provided to the asbestos abatement contractor in writing from the Asbestos Program Manager.

Notification to the Asbestos Program Manager (APM)

1. Notification shall be made to the APM of the following occurrences:
2. Project meetings with asbestos contractors and environmental consultants.
3. Pre-bid, pre-construction, kickoff, and project progress meetings for projects with asbestos abatement components.
4. Notifications to State agencies as detailed above. Copies of subsequent revisions to a notification must also be submitted to the APM.
5. Asbestos abatement activity information to include location, material to be abated, dates and times of work, abatement contractor, environmental consultant, and TCF Center project manager/coordinator.
6. Inspections from state or federal agencies regulating asbestos such as MIOSHA, DEQ-AQD, OSHA, and EPA.

Project Design

Certain asbestos abatement activities warrant development of a comprehensive project design. These documents
define the expectations of the TCF Center, the requirements of the work, and the scope of the project, and can ultimately be used as part of the bid process. Many projects are simple enough that no project design is required, and a "scope of work" letter may be all that is needed. The determination to prepare a formal specification or scope of work will be made on a case by case basis by the Project Design Representative and the Asbestos Program Manager. If formal specification documents are produced for a project, they must be prepared by a Project Designer accredited by the Michigan Department of Licensing and Regulatory Affairs (DLARA).

All projects involving Asbestos disturbance are first directed to the Asbestos Program Manager. It is the responsibility of the assigned Project Design Representative to make the appropriate contact.

1. Contact Appropriate TCF Staff Member (APM)
2. Provide Scope of the proposed project
3. Review existing records and conduct initial site walk through
4. Schedule project; write release for consultant services (I.e.: Design Reps, Construction Reps, GC's, Abatement Contractors, Environmental Consultants)
5. Schedule Type II Asbestos Inspection (if necessary)
6. Review inspection results and specification developed by consultant

7. Authorize work order changes

Where specifications are required, they shall be in National Institute for Building Sciences (NIBS) format for inclusion in complete project specification under Construction Specifications Institute (CSI) 2004 standard section 028200. General Terms and Conditions (front-end documents) need not be provided by consultant.

Emergency Response Procedures
A fiber release episode is any uncontrolled or unintentional disturbance of asbestos-containing building materials
resulting in visible emission or debris. The likelihood of an emission depends on the friability of the material as well as the physical condition which includes the state of deterioration and/or delamination, physical damage, water saturation.

Minor fiber release episodes are defined as the falling or dislodging of three square or linear feet or less of friable asbestos while major fiber release episodes are defined as the falling or dislodging of greater than three square or linear feet or more of friable asbestos. In the event of *any* asbestos fiber release episode the following procedures should be *immediately* followed:

1. Do not attempt to clean.
2. Exit the area and restrict access by others by posting appropriate warning signs.
3. Notify your supervisor. If your supervisor is not available contact the TCFBE at 313.877.8284
4. Direct the Control Room to shut down the HVAC system serving the area.
5. APM for Asbestos will design a response action consistent with 40 CFR 763.91 and engage the open order asbestos abatement contractor(s) and environmental consultant(s) as necessary.

Best Management Practices
The Building Engineering Department maintains the “Best Management Practices” guidelines for operations. Current Best Management Practices at TCF Center include:
Abate ACM impacted during the course of renovation or any other work activities.
If a building or portion of ` building will be demolished, all ACM must be abated, including NESHAP Category I and Category II materials.

1. Do not cover any ACM including vinyl floor tile, mastic, rolled vinyl flooring products, pipe insulation, or any other material that has the potential to deteriorate while covered. Leaving these materials results in much higher costs and presents complications for future projects.
2. Fire doors containing an asbestos core shall not be modified in any way if contact with or disturbance of the asbestos within the door is required to make the modifications.
3. Do not use asbestos containing lab gloves, wire mesh screens, test-tube holders, or other similar laboratory equipment. Contact the APM for disposal options.
4. No material containing asbestos shall be installed on TCF Center owned property at any time for any reason.
5. Non-Asbestos replacement materials shall be permanently labeled in a manner that future contractors and TCF Center staff can easily recognize the replacement product as non-asbestos and can easily determine the limits of the replacement product.

Contractor Safety Agreement

PURPOSE

The purpose of this document is to outline how contractor work at TCF Center will be provided to contractors with a clear and concise understanding of the safety requirements while working at TCF Center.

RESPONSIBILITY

The following general obligations and the more specific obligations associated with specific OSHA standards are to be enforced by the TCF Center Facilities Manager and the Senior Operations Manager who has overall responsibility for contractor compliance, access and adherence to TCF Center safety procedures.

GENERAL REQUIREMENTS FOR CONTRACTORS AT TCF CENTER TCF

Center is a multi-employer workplace. TCF / ASMG expect the contractors it hires to work safely and follow all OSHA requirements covering the work that they perform. The following policies cover all contractors working at TCF Center. Those contractors hired to perform certain high-risk tasks such as construction, show prep, ejection pit entry, arena rigging, high voltage proximity work, and scaffold erection are subject to the more specific requirements covering those activities. Please see TCF / ASMG's confined space entry, hazard communication, safe electrical work practices, fall protection, scaffolding and lock out tag out for specific contractor requirements pertaining to these activities.

- Alert security of your arrival; when parking does not park in assigned spaces, and do not block doors, ramps, docks, or walk-ways.
- Sign-in with Security; obtain visitor's pass; leave cell phone number of Contractor foremen
- Enter and leave the property through the Security Office
- All packages, including lunch boxes and toolboxes are subject to inspection upon arrival and departure of the property
- MSDS sheets must be available and shared with the TCF Facilities Manager for all hazardous chemicals used by the contractor on TCF Center property prior to starting work TCF Safety Program – Contractor Safety Revised Sept 2016 Page 2
- All hazardous chemicals must be labeled as required by OSHA
- All hazardous chemicals must be removed from TCF Center when the contractor's work is finished for the day or shift. If overnight storage is necessary, the contractor must first obtain prior approval from the TCF Facilities Manager.
- Contractors are responsible for the proper disposal of all hazardous chemicals or waste
- Contractors must limit their employees' access and movement to its assigned general work area
- Contractors' must provide all necessary safety equipment as required by OSHA and ASMG.
- Contractors must observe and obey all TCF management safety instructional signs
- Contractor employees must wear personnel protective equipment required as required by TCF / ASMG or by its own Safety and Health Program.
- Contractor employees must not enter unauthorized areas
- Contractor employees must follow Lockout/Tagout procedures as required by OSHA standard 1910.147 and 1910.333

SELECTING CONTRACTORS

The TCF Facilities Manager shall be involved in the selection of contractors hired by ASMG to perform work at TCF Center. The Facilities Manager's approval must be obtained to hire a contractor to perform any work at TCF Center that involves specific OSHA requirements e.g. LOTO, Confined Space, Ladder Safety, Scaffold erection. The following list is an outline of considerations that will help the Facilities Manager come to his/her decision on selecting a contractor. There is no specific way to score the answers to these questions in making a final decision. However, the TCF Facilities Manager must use this information and his/her professional judgment along with an interview with the contractor's own Safety Director together in formulating and defending his decisions. Depending upon the potential risk to TCF / ASMG employees involved from the activities to be performed by the contractor, ONE single "no" answer could be enough to disqualify that contractor from consideration. TCF Safety Program – Contractor Safety Revised Sept 2016 Page 3 As an example, a contractor hired to perform asbestos abatement or confined space entry, high voltage electrical work, scaffolding erection or dismantling should be scrutinized and removed from consideration with fewer "no" answers than a contractor hired to wash windows from the ground level using hand held equipment.

1. Does the Contractor have an established and implemented worker safety and health program that includes personnel training?

2. After reviewing the Contractor's safety and health program, is it meaningful and being implemented?

3. Does the Contractor have a worker compensation experience modification rate of one or less?

4. Does the Contractor have employees that understand and read English? If not, does the Contractor adequately address (potential) language barrier issues for the safety of its workers?

5. Does the Contractor have a history of serious, repeated, or willful violations or fatal accidents (one or more) from any authority such as OSHA or PESH within the past 5 years?

6. Does the Contractor have written programs for basic worker safety required by OSHA e.g. Hazard Communication, LOTO, electrical safety and the specialty training required of when doing specialized work (i.e.: Permit Required Confined Space Entry)

7. Does the Contractor have an established work history with other reputable firms that will recommend their work with respect to worker safety (i.e.: references)?

8. Does the Contractor have its own Safety Director or someone responsible for worker safety?

9. As applicable to the tasks being contracted, does the Contractor have "competent" and/or "qualified" personnel?

10. Does the contractor have records to document the training of its competent or qualified personnel?

11. Does the contractor have a written policy that describes how it will enforce safe work practices?

TCF / ASMG's CONTRACTOR OVERSIGHT

Contractor work will be routinely inspected for conformance to TCF / ASMG's safe work practices and for violations of OSHA requirements by the TCF Facilities Manager or Senior Operations Manager or

his/her representative (i.e.: Craft Foremen, Program Manager). Depending upon the work being performed and the risks involved to employees, this inspection process may be constant -- ASMG will have a representative nearby observing the contractor work at all times. ASMG will document these inspections and archive the results. All violations will immediately be brought to the contractor's attention and corrected before work continues. A written description of the hazardous condition will be part of a warning letter hand delivered to the contractor that same day that also specifies that a recurrence or additional unsafe work practices can and may lead to immediate contract breaching and TCF Safety Program – Contractor Safety Revised Sept 2016 Page 4 dismissal. This enforcement power over contractor work will be written into bid specifications as part of the hiring process to ensure the contractor is aware of this possibility should it fail to work safely.

If the TCF Facilities Manager or Senior Operations Manager determines that the condition is serious enough that it demonstrates a disregard for the safety of the contractor's employees and ASMG employees or both and puts these employees at risk of serious bodily harm or death, the Manager(s) will consult with the General Manager to determine if the contractor will be immediately dismissed. If the condition warrants it, the contractor will be dismissed immediately and asked to cease all work and leave TCF Center.

This enforcement power over contractor work will be written into bid specifications as part of the hiring process to ensure the contractor is aware of this possibility and will act accordingly.

BID SPECIFICATIONS

Bid specifications will include language that holds the contractor directly responsible for:

- General safety and health of its employees via a universal contract clause

- A specific clause that identifies those particular OSHA standards governing the specific work being contracted (e.g. Permit Required Confined Space Entry) for which the contractor must comply. The language will identify the need for finished work and installations to conform to the current and relevant specific consensus codes like the National Electrical Code or National Fire Protection Association codes as well as the standards covering the safety of the employees conducting the work (e.g. OSHA's Safe Electrical Work Practices). This language must be drafted by the Facilities Manager and reviewed and approved by the Senior Operations Manager as well as any corporate legal personnel deemed appropriate.

- A specific clause that notifies the contractor those serious worker safety infractions as determined by TCF / ASMG can and will lead to its immediate dismissal from the premises.

- Oversight – Establish oversight, coordination, and enforcement to ensure the contractor safety and health program is adequate and implemented properly. – Verify that contractors comply with applicable safety and health regulations by conducting regular inspections of the area where the contractors are working

- Prompt Control of Hazards – Ensure prompt correction and/or control of any hazards that are identified under the contractor's control. – Consider penalties such as contractor correction and/or contractor dismissal for repeated noncompliance by contractors, vendors, or individuals.

Crisis Communication

Should an emergency arise in the course of the TCF Center business, the communication plans outlined below will be implemented. Three levels of crisis have been defined and identified. Communications will vary depending on the level of crisis. **For Levels 2+3, communications teams to refer to the Detroit Police Department.**

LEVELS of CRISIS

LEVEL 1 – an isolated incident in a controlled area that can be managed without significant impact to the overall event, and without significant perceptual damage.

Examples include a spectator medical emergency, vehicular accident, malfunction of an event element that creates no safety issues and is not integral to the success of the event (sound system failure, food & beverage shortages, traffic jams, etc.)

LEVEL 2 - Defined as an incident that adversely affects the press conference or block party. Perceptual Damage potential exists.

Examples include breaches of security that do not impact the safety of spectators, a fight that does not involve weapons or serious injuries.

*If required, crisis team will call conference line or convene at crisis location **(See Crisis Conference Line and Crisis Meeting Location Sections for specifics)**

LEVEL 3 - Defined as an incident that has a wide-ranging effect on the entire production/execution of the event, act of violence or critical civil emergency.

Examples include an act of violence involving weapons and/or significant injury, anything that jeopardizes guest safety, weather conditions that create safety issues, any situation that may cause contemplation of event cancellation.

In the event of a LEVEL 3 Crisis, the following organizations will immediately convene as directed by the Chief of Police or at the designated crisis location.

Convening Organizations:

1) DRCFA / TCF Center

Larry Alexander		LAlexander@visitdetroit.com
Claude Molinari	(313) 498-7339	cmolinari@tcfcenterdetroit.com
Patrick Bero	(248) 425-1485	PBero@DRCFA.org
Matt Lancaster (security)	(313) 269-7478	mlancaster@tcfcenterdetroit.com
Mary Klida	(847) 561-5945	mklida@tcfcenterdetroit.com

Official Spokespersons: Larry Alexander, Claude Molinari

2) TCF Bank

Tom Wennerberg	(216) 905-0455	
Tom.Wennerberg@chemicalbank.com		
Shellie Maitre	(248) 895-3980	Shellie.Maitre@chemicalbank.com
Amie Hoffner	(612) 239-5918	AHoffner@tcfbank.com

Official Spokespersons: Amie Hoffner

3) **Lovio George**

Christina Lovio-George	(313) 701-2439	cloviogeorge@loviogeorge.com
Heather George	(248) 417-5773	hgeorge@loviogeorge.com
Bridget Burns	(313) 218-2505	bburns@loviogeorge.com
Sara Campbell	(315) 727-3280	scampbell@loviogeorge.com

4) **DPD/Chief of Police** (related to any and all safety and traffic issues)

5) Corporal Denise V. Walker	(313) 661-3613	WALKERD466@detroitmi.gov
Lieutenant Kimberly Blackwell	(313) 570-2724	blackwellk712@detroitmi.gov
Sergeant Clive Stewart	(313) 806-6812	stewartc158@detroitmi.gov

Official Spokespersons: Corporal Denise V. Walker

7) **City of Detroit/Mayor Duggan's Office**

Alexis Wiley (318) 401-7438
WileyA@detroitmi.gov
John Roach (313) 244-7857
roachj@detroitmi.gov

Official Spokespersons: Mayor Duggan

Other resources:

FBI

John Brand	(313) 965-6084	
Damon Brown, ATF Liaison	(313) 570-5739	damon.brown@atf.gov

City of Detroit, Homeland Security & Emergency Management

Robert Brown, Operations Chief	(313) 588-1341	brownro@detroitmi.gov
Donna Northern	(313) 600-5266	northernd@detroitmi.gov
Hilton Kincaid	(313) 300-7486	
kincaidh757@detroitmi.gov		

Wayne State Police

Chief Tony Holt, Wayne State Police Chief	(734) 612-5352
WSU officer in charge	(313) 577-2222

Decision to be made as to how to handle press inquiries or advisory/communication with media.

ESTABLISHED CONFERENCE CALL INFORMATION FOR CRISIS TEAM CALLS

This number is to be used for group conference calls to assess a crisis situation and when the group is unable to meet in person. **No setting up required or advance notice – may be done immediately.**

- Distribute call in number
- All callers will be asked if they are the Moderator. Only Moderator will be prompted to enter Pin # (see below). All other participants will only have to enter the Conference I.D. #

- Participants will be connected when Conference I.D. # is entered at the prompt. They will not be connected until Moderator has called in first.

CRISIS MEETING LOCATION AND PROCESS

- **Executive offices at TCF Center has been secured for the crisis team.**

CRISIS COMMUNICATIONS STEPS

1. **First comment by TCF Center** should show responsiveness to situation. For example: "We are aware of the situation. We will comment after we have more facts."

2. **TCF Center to brief stakeholders immediately**. Following this, management team and partner organizations will be made aware of the issue and what we (official spokesperson) are saying publicly.

3. **Mass text to employees if necessary.**

4. **Convene immediate meeting of crisis team**. Meeting place established in the Executive offices at TCF Center. Conference call established for 24-hour, immediate access.

5. **Gather as much information as possible**. Contact all sources quickly and establish facts.

6. **Formulate statement that can be issued to the media as soon as possible**, e.g. within the same news cycle as initial break of story. Assure media that more comment will be available. Share with partner organizations.

7. **Formulate action plan** – statements, press releases that need to be written, possible press conferences/briefings, etc.

8. **Develop list of allies and contact them in order to both give them suggested comments** as well as to gather information from them.

9. **Develop talking points and send to allies who will be speaking to media**. Put media in touch with these allies.

10. **Continue to keep stakeholders/media informed**.

11. **Plan follow-up/reaction stories**.

Documentation Team

PURPOSE

The purpose of the Documentation Team is for the collection of consistent, thorough, and accurate information regarding incidents at TCF Center. The TCF Center Manager of Public Safety & Security, along with the Public Safety & Security Team, will also monitor the Facility to see that it is safe and free from hazards before and during events.

The following information explains the procedures for the operation of the Documentation Team (Doc Team) and the completion of the various reports.

TEAM MEMBERS

The Doc Team consists of the following individuals:

* Manager of Public Safety & Security
* Assistant Manager of Public Safety & Security
* Public Safety & Security Supervisors
* Securitas Security Supervisors and Personnel
* Senior Event Staff Supervisor(s)

RESPONSE TEAM

The Public Safety & Security Team (PSST) will respond to all incidents. PSST will be responsible for all initial investigation and documentation. The other Doc Team members will assist the PSST during simultaneous incidents. The PSST will communicate with Security Control or the Senior Event Staff Supervisor(s) when responding to an incident.
Incidents include injuries, accidents, disturbances, drug or alcohol problems and disasters (natural and man-made) that affect our guests, clients, or employees' pre-event, during events and post-event.

PUBLIC SAFETY & SECURITY TEAM DUTIES

The PSST will be responsible for the following duties:

Door Opening: The PSST will monitor ingress, watching for potential problems.

Start of the Event: The PSST will concentrate monitoring in the public areas.

All Times: Respond to any accident, injury, or incident.

Post-Event: Monitor egress and finish filing reports.

DOCUMENTATION

The following form is to be used to record incidents/information:

INCIDENT REPORT

The Incident Report should be filled out completely by the PSST under the following guidelines. When completed, reports are currently submitted by email to the following: General Manager, Operations Director, Security Manager, Assistant Security Manager.

1) **Case #:** The case # Current structure is year followed by sequential number (ex. 19-0001).

2) **Event:** Print the full name of the event

3) **Date:** Month, day, and year (7-15-15)

4) **Day:** Day of week (Wednesday)

5) **Time:** Use military time (I.E. 1300 hrs. for 1:00pm)

6) **Location of Incident:** Exact location at the Facility, including the building name and/or room number

Area Condition: Note all relevant information (I.E. well lit, area dry)

7) **Medical Response:** Name of EMT(s) responding

8) **Police Response:** Name of Police Officer(s) responding

9) **Fire Response:** Name of Fire Department staff responding

10) **Other:** Name of any off-duty service individual(s) responding

11) **Administrative Notification:** Name and department of Administrative staff responding

12) **Involved Persons:** Fill in name, address, telephone number and date of birth. If they are a Facilities employee, write down their department and I.D. number.

13) **Investigated by:** Name of person who investigated

14) **Additional Reports:** All other reports completed (I.E. Statement of Witness, Injury report, Police or Fire Inspection report, Comment forms, etc.) should be attached to the Incident Report.

15) **Photos Taken:** Mark Yes or No if photos were taken. Include any photos that were taken with the report.

16) **Narrative:** In the narrative, give a detailed description of WHO, WHAT, WHERE, WHEN and HOW the incident happened. Tell how you were notified, such as by radio, in person, etc., and by whom you were notified. Tell what action was taken and by whom. Be as accurate as you can, stating all the known facts as you understand them.

FILING OF A REPORT

Reports will be a single copy. After the event is completed, the Security Operations Supervisor will file the original Incident report along with all attachments with the PS&S Manager, GM, Dir. of Ops.

FILING OF A REPORT BY A GUEST AFTER AN EVENT

If a guest calls or comes in after an event to report an incident, the guest should be directed to file a report with the PSST. They will be responsible for completing the report and filing it according to the above guidelines.

FILING OF A REPORT BY AN ATTORNEY AFTER AN EVENT

If an attorney calls, forwards a letter or files a claim after an event, the attorney should be directed to the General Manager. The General Manager will direct the Facilities' official response to the attorney.

GUESTS CALLING TO CHECK THE STATUS OF A CLAIM

Guests who call in to find out the procedure for filing a claim or who are checking the status of a claim is referred to the TCF Center web site and direct them to file an FOIA request.

Team Duties

The team's priority duty is the collection of facts and the sharing of those facts with the other team members. The application of those facts to the particular task will then ensure that the best possible outcome is achieved. The team will be required to meet to discuss its needs at least once a month under the guidance of the Safety Committee Chairperson. One member will be assigned the task of taking minutes and the minutes of the meeting will uploaded to the AASMG ALTUM website, archived, and made available to all facility staff members prior to the next scheduled team meeting. The Safety Committee Chairperson will determine the meeting agenda.

Typical discussion points may include:

- Patron complaints involving their safety that may also impact employee safety or vice versa.
- Overall OSHA compliance audits
- On-going investigations or accidents
- New investigations or near misses
- Job Safety Analysis - new ones and modifications which must be recorded and disseminated.
- Updating and maintenance of required safety programs.
- Ensuring that ASMG Corporate required computer databases are maintained as current.

OSHA requires documentation in the following areas:

- Training: ongoing, new employees and retraining for all required OSHA programs
- Inspections/audits of all kinds such as PPE use and availability, forklifts, fire extinguishers, ladders, extension cords
- OSHA Materials required to be conveyed to employees such as material safety data sheets

- Respirator Fit Testing
- Any and all workplace air monitoring for asbestos or any other airborne or surface contaminant or hazardous chemical
- OSHA 300 log
- Required OSHA has written program updates and modifications
- Specific LOTO procedures – new or modifications
- New or modified JSAs
- Employee warnings or other disciplinary actions taken following work rule violations
- Modification of Safety Work Rules
- Post exercise and drill evaluations (e.g. Evacuation, emergency response to Freon 22 leaks)
- Contractor information including information required to be shared by the contractor and ASMG under multi-employer working conditions (e.g. Permit required confined space, LOTO, Hazard Communication)

A full team response will typically be necessary when critiquing the Emergency Response Plans, changes to any established OSHA required programs and facility safety programs.

Driver Safety

Vehicle Safety and Accident Reporting Policy

The purpose of this Policy is to ensure the safety of those individuals who drive ASMG vehicles and any ASMG vehicles that are operated inside of the Center. Vehicle accidents are costly, but more importantly, they may result in injury to you or others. It is the driver's responsibility to operate the vehicle in a safe manner and to drive defensively to prevent injuries and property damage. As such, ASMG endorses all applicable state motor vehicle regulations relating to driver responsibility. ASMG expects each driver to drive in a safe and courteous manner pursuant to the following safety rules. The attitude you take when behind the wheel is the single most important factor in driving safely.

Driver Eligibility

1. ASMG vehicles are to be driven by authorized employees only, except in emergencies, or in case of repair testing by a mechanic. Spouses and other family members are not authorized to drive the ASMG vehicle.
2. Any employee who has a driver's license revoked or suspended shall immediately notify the Public Safety & Security Manager and discontinue operation of the ASMG vehicle. Failure to do so may result in disciplinary action, including dismissal.
3. All accidents, regardless of severity, must be reported to the police and to the TCF Public Safety Manager
4. Failing to stop after an accident and/or failure to report an accident may result in disciplinary action, including dismissal.
5. Drivers must immediately report all summonses received for moving violations during the operation of a ASMG vehicle to the TCF Center Public Safety Manager.
6. All ASMG drivers must comply with all applicable D.O.T. regulations, including successful completion on medical,

drug, and alcohol evaluations.

7. Motor Vehicle Records will be ordered periodically to assess employees' driving records. An unfavorable record will result in a loss of the privilege of driving a ASMG vehicle.

The following system will be used to determine eligibility to operate a ASMG vehicle:

1. **All type 'A' violations (as defined below) will result in termination of driving privileges for employees and will disqualify any potential driver employees.**

2. **Any drivers (employees or applicants) showing one of the following will be restricted from driving company vehicles:**

   One (1) or more type 'A' violations in the last 3 years
   Three (3) or more accidents (regardless of fault) in the last 3 years
   Three (3) or more type 'B' violations in the last 3 years
   Any combination of accidents and type 'B' violations which equal four (4) or more in the last 3 years.

Type 'A' Violations:

- Driving While Intoxicated
- Driving While Under the Influence of Drugs
- Negligent Homicide Arising out of the use of a Motor Vehicle (gross negligence)
- Operating During a period of Suspension or Revocation
- Using a Motor Vehicle for the commission of a Felony
- Aggravated Assault with a Motor Vehicle
- Operating a Motor Vehicle Without the Owners Authority (grand theft)
- Permitting an Unlicensed Person to Drive
- Reckless Driving
- Speed Contest (racing)
- Hit and Run (Bodily Injury or Property Damage)

Type 'B' Violations

- All Moving Violations not listed as type 'A' Violations

Driver Safety Rules

1. The use of a ASMG vehicle while under the influence of intoxicants and other drugs is forbidden and is sufficient cause for discipline, including dismissal.
2. No driver shall operate a company vehicle when his/her ability to do so safely has been impaired by illness, fatigue, injury, or prescription medication.
3. All drivers and passengers operating or riding in ASMG vehicles must wear seat belts, even if air bags are available.
4. No unauthorized personnel (e.g. Hitchhikers) are allowed to ride in SG vehicles.
5. Drivers are responsible for the security of ASMG vehicles assigned to them. The vehicle engine must be shut off, ignition keys removed, and vehicle doors locked whenever the vehicle is left unattended. If the vehicle is left with a parking attendant, only the ignition key is to be left.
6. Head lights shall be used from sunset to 1/2 hour before sunrise, or during inclement weather or at any time when a distance of 500 feet ahead of the vehicle cannot be seen clearly.

7. All other state laws, local laws, or D.O.T. Motor Carrier Safety Regulations must be obeyed.

Defensive Driving Rules

1. Drivers are required to maintain a safe following distance at all times. To estimate your following distance, pick a stationary object ahead of you. As the vehicle in front of you passes the object, begin counting 1001, 1002, 1003, etc. until you reach the same object. This counts the number of seconds between you and the vehicle ahead of you.
   1.1. Drivers of passenger vehicles should keep a two-second interval between their vehicle and the vehicle immediately ahead. During slippery road conditions, the following distance should be increased to at least four-seconds.
   1.2. Drivers of heavy trucks should keep a minimum of a three-second interval when not carrying cargo; and at least four-seconds when fully loaded. Following distance should also be increased when adverse conditions exist.

3. Drivers must yield the right of way at all traffic control signals and signs requiring them to do so. Drivers should also be prepared to yield for safety's sake at any time. Pedestrians and bicycles in the roadway always have the right of way.

4. Avoid driving in other driver's blind spots; attempt to maintain eye contact with the other driver, either directly or through mirrors.
5. Drivers must honor posted speed limits. In adverse driving conditions, reduce speed to a safe operating speed that is consistent with the conditions of the road, weather, lighting, and volume of traffic. Tires can hydroplane on wet pavement at speeds as low as 40 MPH.
6. Turn signals must be used to show where you are heading, while going into traffic and before every turn or lane change.
7. When passing or changing lanes, view the entire vehicle in your rear-view mirror before pulling back into that lane.
8. Be alert of other vehicles, pedestrians, and bicyclists when approaching intersections. Never speed through an intersection on a caution light. Approach a stale green light with your foot poised over the brake to reduce your reaction time should it be necessary to stop. When the traffic light turns green, look both ways for oncoming traffic before proceeding.
9. When waiting to make left turns, keep your wheels facing straight ahead. If rear-ended, you will not be pushed into the lane of oncoming traffic.
10. When stopping behind another vehicle, leave enough space so you can see the rear wheels of the car in front. This allows room to go around the vehicle if necessary and may prevent you from being pushed into the car in front of you if you are rear-ended.
11. Avoid backing up where possible, but when necessary, keep the distance traveled to a minimum and be particularly careful.
    10.1. Check behind your vehicle. Operators of heavy trucks should walk around their vehicle before backing and/or have someone guide you.
    10.2. Back to the driver's side. Do not back around a corner or into an area of no visibility.

What To Do In Case of An Accident

In an attempt to minimize the results of an accident, the driver must prevent further damages or injuries and obtain all pertinent information and report it accurately.

1. Call for medical aid if necessary.
2. Secure accident scene -- pull onto shoulder or side of road, redirect traffic, set up road flares/reflectors, etc.
3. Call the police. All accidents, regardless of severity, must be reported to the police. If the driver cannot get to phone, he should write a note giving location to a reliable appearing motorist and ask him to notify the police.
4. Record names and addresses of driver, witnesses, and occupants of the other vehicles and any medical personnel who may arrive at the scene.
5. Complete the form locating in the ASMG Vehicle Accident Report. Pertinent information to obtain includes:
   5.1. license number of other drivers.
   5.2. insurance company names and policy numbers of other vehicles
   5.3. make, year, model of other vehicles 5.4. date and time of accident
   5.5. overall road and weather conditions
6. Draw a diagram of the accident scene and note the street names and locations of traffic signs, signals, etc.
7. Do not discuss the accident with anyone at the scene except the police. Do NOT accept any responsibility for the accident. DO NOT argue with anyone. Provide the other party with your name, address, phone number, driver's license number, and insurance information.
8. Immediately report the accident to the TCF Public Safety Manager. Provide a copy of the accident record and/or your written description of the accident to the TCF Public Safety ManagerASAP.
9. Cooperate fully with any follow-up from ASMG management.

Vehicle Expenses & Record Keeping (optional)

*** Discuss any reporting or tracking of mileage required. *** Discuss reporting requirements and/or records the driver must maintain for maintenance & repairs performed on the vehicle assigned to them.
*** Discuss expense reporting and reimbursement for gasoline & maintenance. *** Discuss any personal use charges that may apply. I acknowledge that the information contained in the ASMG Driver Safety Policy has been reviewed with me and a copy of the policy and driver rules have been furnished to me. As a driver of a company vehicle, I understand that it is my responsibility to operate the vehicle in a safe manner and to drive defensively to prevent injuries and property damage.

Print Employee Name:_____ Date:_____

Employee Signature:_____ Reviewer's Signature_____

(Sign and retain the original copy in the employee's file)

Electric Pallet Jack Safety

Electrical Safety

Reference - OSHA 29 CFR 1910.331-339
ASMG Best Practices 02.02.04

PURPOSE

This program serves to describe ASM Global's policy and obligations under OSHA's standards addressing electrical safety for qualified and unqualified persons. TCF Center has electricians and other maintenance people who are covered by these standards; OSHA standards - 29 CFR 1910.331-335.

QUALIFIED PERSON

A Qualified person is one who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved. Whether an employee is considered to be a "qualified person" will depend upon various circumstances in the workplace. For example, it is possible and, in fact, likely for an individual to be considered "qualified" with regard to certain equipment or tasks in the workplace, but "unqualified" as to other equipment or tasks on that equipment.

As the risk and potential hazards increase so must the level of training to ensure safe work practices. Personnel safety requirements have and continue to evolve. Therefore, *Qualified* electricians at TCF Center shall be provided a copy of the 2012 NFPA 70E Handbook for Electrical Safety in the Workplace as a reference. In the event there are any conflicts between this written program and the requirements in NFPA 70E, the 2012 NFPA 70E is the final word. Whenever NFPA 70E is updated, ASM Global shall ensure that its qualified persons have it available to use as a reference.

- All TCF Center electricians are required to be licensed journeyman.

LOCK OUT/TAG OUT OF ELECTRICAL EQUIPMENT

ASM Global's blanket policy is that whenever possible, electrical parts shall NOT be worked on "live" or "energized". This means that in addition to simply disconnecting current carrying parts from their source of energy, the disconnecting means must be locked and/or tagged out and otherwise brought to an Electrically Safe Working Condition. ASM Global's written LOTO program incorporates these LOTO requirements. Other steps needed to reach an electrically safe work condition are also found in this document.

RESPONSIBILITY

The Facilities Manager, working in concert with the Electrical Foreman is responsible for the following:

- Develop and administer the written Electrical Safe Work Practices Program.
- Select and provide electrical protective equipment for Qualified employees.
- Determine if TCF Center Qualified personnel have the SAFETY training needed.
    - In other words, does their safety training match the level of potential hazards they face?
    - This includes the additional training for situations where Qualified personnel must work on or near "live" parts including approach distances, PPE, and testing equipment.
- Assure that all TCF Center electrical equipment is properly labeled.
- Assure all employees covered by this program have been trained in this program.
- Conduct documented audits of work assignments to ensure all electrical safe work practices and procedures are followed.
- Ensure compliance concerning inspection of personal protective equipment for availability and integrity.

LABELING OF PANELS AND DISCONNECTS

Each disconnecting means required by this subpart for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. This labeling is critical to implementing a sound LOTO program for electrical parts.

These markings shall be of sufficient durability to withstand the environment involved. A disconnecting means is a switch that is used to disconnect the conductors of a circuit from the source of electric current. Disconnect switches are important because they enable a circuit to be opened, stopping the flow of electricity, and thus can effectively protect workers and equipment. Each disconnect switch or overcurrent device required for a service, feeder, or branch circuit must be clearly labeled to indicate the circuit's function, and the label or marking should be located at the point where the circuit originates.

EXAMPLE: A panel that controls several motors or on a motor control center, each disconnect must be clearly marked to indicate the motor to which each circuit is connected. If the purpose of the circuit is obvious, no identification of the disconnect is required.

ARC FLASH ANALYSIS

An arc flash hazard analysis includes the following:

Collect data on the facility's power distribution system. Arrangement of components on a one-line drawing with nameplate specifications of every device.

- Lengths and cross-section area of all cables.
- Contact the electric utility for information including the minimum and maximum fault currents that can be expected at the entrance to the facility.
- Conduct a short circuit analysis followed by a coordination study is performed.
- Feed the resultant data into the NFPA 70E-2000 or IEEE Standard 1584-2002 equations.
    - These equations produce the necessary **flash protection boundary distances** and **incident energy** to determine the minimum PPE requirement.

- The **flash protection boundary** is the distance at which PPE is needed to prevent incurable burns (2nd degree or worse) if an arc flash occurs. (It is still possible to suffer 1st or 2nd degree burns.)

- **For systems of 600 volts and less, the flash protection boundary is 4 feet**, based on an available bolted fault current of 50 kA (kiloamps) and a clearing time of 6 cycles (0.1 seconds) for the circuit breaker to act, or any combination of fault currents and clearing times not exceeding 300 kA cycles (5000 ampere seconds).

NOTE: UNTIL AN ARC FLASH ANALYSIS IS DONE, TABLE 130.7(C)(15)(A) and TABLE 130.7(C)(16) OF NFPA 70E SHALL BE USED AS A GUIDE FOR PPE AND RISK ANALYSIS.

ARC FLASH LABELING

TCF Center shall have an Arc Flash analysis done. The Electrical Foreman shall participate in this analysis along with the Facilities Manager. Electrical equipment requiring labeling to announce any Arc Flash hazard must be properly marked. NFPA 70E designates the exact information needed while OSHA's requires that a warning be displayed. ASM Global is required to conduct an assessment in accordance with CFR 1910.132(d)(1) to determine the correct PPE to protect against arc flash. This assessment requires an arc-flash assessment. If an arc-flash hazard is present, or likely to be present, then the employer must select and require employees to use the protective apparel commensurate with the Arc Flash Hazard Analysis. Even if no ASM Global employees are exposed, the assessment must be done.

NOTE: UNTIL AN ARC FLASH ANALYSIS CAN BE DONE - TABLE 130.7(C)(15)(A) and TABLE 130.7(C)(16) OF NFPA 70E 2012 SHALL BE USED AS A GUIDE FOR NECESSARY PPE AND THE TASK RISK ANALYSIS.

LABELING FOR ARC FLASH

Electrical equipment such as switchboards, panel boards, industrial control panels, meter socket enclosures and motor control centers that are likely to require examination, adjustment, servicing or maintenance **while energized** shall be field marked with a label containing all the following information:

1. At least one of the following:
   - available incident energy and the corresponding working distance
   - minimum arc-rating of clothing
   - required level of PPE
   - highest Hazard/Risk Category (HRC) for the equipment

2. Nominal system voltage
3. Arc flash boundary

The NEC **requires** switchboards, panel boards, industrial control panels, and motor control centers **to be field marked** to warn workers of potential electric arc flash hazards.

1. The term Industrial Control Panel covers every enclosure that may contain exposed energized conductors or components.

2. Marking is intended to reduce the occurrence of serious injury or death due to arcing faults to workers working on or near energized electrical equipment.
3. Markings (labels) shall be located so they are visible to the personnel before examination, adjustment, servicing, or maintenance of the equipment.
4. Labels shall be either of the 2 examples (or similar) shown in Figure 1 depending on the available resources of the agency.
5. The first DANGER label shall be used when information is not presently available. This is the minimum NEC 110.16 requirement.
6. The DANGER label should remind a qualified worker who intends to open the equipment for analysis or work:
   - Electric arc flash hazard exists
   - Turn off all power before opening
   - Follow all requirements of NFPA 70E for safe work practices and wear appropriate personal protective equipment (PPE) for the specific hazard.
7. The second DANGER label shall be used when a qualified electrical worker or electrical engineer determines the values of the shock and flash protection information.
8. When arc flash and shock data are available for industrial control panels, labels shall include information on flash hazard boundary, the hazard category, required PPE, minimum arc rating, limited approach distances, restricted approach distances and prohibited approach distances.
9. Only qualified personnel are authorized by ASM Global to work near energized equipment. Apprentice electricians must always be under the direct and constant supervision of an experience qualified electrician trained in safe electrical work practices.

IMPLEMENTATION

ASM Global shall complete an arc flash hazard analysis as required by NFPA 70E -2012. The arc flash hazard analysis shall only be completed by a licensed electrical engineer.

TEST EQUIPMENT

Only qualified persons may perform testing work on electric circuits or equipment. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage each time before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made.

Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.

Qualified personnel shall be familiar with any test equipment assigned to them including its limitations.

TRAINING

All Qualified employees will receive the minimum training:

- General work practices for electrical systems for respective jobs.
- Lockout Tagout Procedures
- Safety related work practices
- Use of Personal Protective Equipment

Training for *Qualified* employees shall conclude with a written test in order to document material retention. Failure to pass the written test shall result in cessation of electrical job functions until a passing grade is attained after retraining.

Additional training or retraining will be provided when there is a change in job assignment, when related accidents occur, new process or equipment, or changes in existing processes or equipment take place. All training will be documented. When assessing training needs, the hazard and risk of the tasks that qualified person will perform shall be the basis for training.

SAFE WORK PERMIT REQUIREMENT

It is ASM Global policy to work only on circuits and equipment that have been brought to a Safe Electrical Working Condition. This means that these parts to be accessed have had their energy source isolated, disconnected, locked, and tagged out and any residual energy dissipated by a qualified person using the appropriate testing equipment and PPE if necessary. However, in the *rare* cases when work must take place on equipment not in an electrically safe working condition, such as trouble shooting, a work permit must be issued by the Manager of Engineering before such activities begin.
An Energized Electrical Work Permit will include:

- Circuit, voltage, amperage, equipment, and location
- Why it is necessary to work while energized – NOTE- reason must be sound with **no other** feasible means to get the work done!
- Shock and arc flash hazard analysis
- Safe work practices
- Approach boundaries
- Required PPE and tools
- Access control
- Proof of job briefing/discussion with the Manager
- The Manager of Engineering's signature.

HIGH VOLTAGE

ASM Global electricians will **never** be required to work on high voltage installations while not in a safe electrical working condition. Proper PPE and testing equipment shall be used whenever manipulating equipment to bring it into a "deenergized" or safe electrical working condition.

In the rare event ASM Global electricians are required to work with or near high voltage, special training will be required to prepare the ASM Global electricians required to bring such equipment to a safe condition. This additional training shall focus on the PPE, test equipment and approach distances for arc flash and shock and additional grounding requirements to remove residual energy involved in bringing such equipment to a safe condition established using lock out/tag out.

NOTE: Such work will also trigger the need for a SAFE WORK PERMIT – SEE ABOVE.

SAFE ELECTRICAL WORKING 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
- Electrically insulated shoes should be worn
- Approved insulating mats
- Safety glasses must be worn
- The required Arc Flash PPE must also be worn

Also,

- Identify all sources of power to the equipment. Check applicable up-to-date drawings, diagrams, and identification tags.
- Remove the load current, and then open the disconnecting devices for each power source.
- Where possible, visually verify that blades of disconnecting devices are fully open or that draw out-type circuit breakers are fully withdrawn.
- Apply lockout/tagout devices in accordance with the documented procedures in ASM Global's LO/TO program.
- 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.
- 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.

GENERAL SAFE ELECTRICAL WORK PRACTICES

The following work practices will always be followed by qualified employees:

- Before repairing or servicing equipment, disconnect it from the power source by following the specific machine's written Lockout/Tag out procedures. If the circuit cannot be locked out, in addition to tagging the switch, a secondary step, such as an electrician removing the fuse, will be taken. Do not remove/install fuses without the proper fuse handling equipment insulted for the voltage.
- Unplug portable electrical hand tools when not in use. Inspect before every use. Remove damaged equipment from service until repaired and tested.
- Do not use any equipment that has frayed cords or ground prong removed. Use grounded extension cords and multi-socket cords with a solid box only.
- Be sure to use the proper power receptacle for each application.
- Inspect extension cords before each use and discard them if damaged, especially if the grounding pin is missing
- Use fiberglass ladders when working on or near live electrical equipment.
- Do not wear rings or other jewelry when working on electrical equipment.
- Avoid temporary wiring. Use appropriate ground fault circuit interrupters if conditions become wet

- Protect extension cords during shows using appropriate bridges and tunnels.
- When working on de-energized the parts, but still inside the flash protection boundary for nearby live exposed parts:
  - Employees shall not reach blindly into areas that might contain exposed live parts.
  - Employees shall 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) shall 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 shall 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.

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.
- ASM Global shall provide electrical protective equipment (Arc Flash Gear) required by this program when the assessment determines its necessity. Such equipment shall include 11 calorie, and 40 calorie rated Arc Flash apparel (until a full arc flash hazard analysis is made), eye protection, head protection, hand protection, insulated footwear, and face shields where necessary

Protective Clothing Characteristics

- Employees shall 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 shall 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.
- Employees shall wear rubber insulating gloves where there is a danger of hand or arm contact with live parts or possible exposure to arc flash burn.
- Where insulated footwear is used as protection against step and touch potential, dielectric overshoes shall be required. Insulated soles shall not be used as primary electrical protection.
- Face shields without arc rating shall 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.

- Protective Equipment must be selected to meet the criteria established by the American Society of Testing and Materials (ASTM) and by the America National Standards Institute (ANSI).
- Insulating equipment made of materials other than rubber shall 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.

SPECIFIC REQUIREMENTS FOR PERSONAL PROTECTIVE EQUIPMENT AGAINST ELECTRIC SHOCK

ASM Global will adhere to the requirements in 1910.137 for the selection, care and maintenance of PPE designed to protect against electric shock.

APPROACH DISTANCES

2012 NFPA 70E –TABLE 130.4(c)(a) Approach boundaries to live parts for <u>shock prevention</u>

Limited Approach Boundary – An approach limit is a distance from an exposed live part within which a shock hazard exists.

Restricted Approach Boundary – An approach limit distance from an exposed live part within which there is an increased risk of shock, due to electrical arc-over combined with inadvertent movement, for personnel working in close proximity to the live part.

Prohibited Approach Boundary – An approach limit distance from an exposed live part within which work is considered the same as making contact with the live part.

	Limited approach boundary	**All dimensions are distance from live part to employee**

Nominal system voltage range, phase to phase	Exposed movable conductor	Exposed fixed-circuit part	Restricted approach boundary (allowing for accidental movement)	Prohibited approach boundary
0 to 50 volts	Not specified	Not specified	Not specified	Not specified
51 to 300 volts	10 ft. 0 in.	3 ft. 6 in.	Avoid contact	Avoid contact
301 to 750 volts	10 ft. 0 in.	3 ft. 6 in.	1 ft. 0 in.	0 ft. 1 in.
751 to 15 KV KV	10 ft. 0 in.	5 ft. 0 in.	2 ft. 2 in.	0 ft. 7 in.
15.1 kV to 36 KV	10 ft. 0 in.	6 ft. 0 in	2 ft. 7 in.	0 ft. 10 in.
36.1 KV to 46 kV	10 ft. 0 in.	8 ft. 0 in	2 ft 9 in.	1 ft. 5 in.
46.1 KV to 72.5 KV	10 ft. 0 in.	8 ft. 0 in.	3 ft 2 in.	2 ft. 1 in.
72.6 KV to 121 KV	10 ft. 8 in.	8 ft. 0 in.	3 ft. 3 in.	2 ft. 8 in.
138 to 145	11 ft 0 in	10 ft. 0 in.	3 ft. 7 in	3 ft. 1 in.
161 KV to 169 KV	11 ft 8 in.	11 ft. 8 in.	4 ft. 0 in.	3 ft. 6 in.
230 KV to 242 KV	13 ft. 0 in.	13 ft. 0 in.	5 ft. 3 in.	4 ft. 9 in.
345 KV to 262 KV	15 ft. 4 in	15 ft. 4 in.	8ft. 6 in.	8 ft. 0 in.

Source: From a portion of table 2-1.3.4, Approach Boundaries to Live Parts for Shock Protection (NFPA 70E *Standard for Electrical Safety Requirements for Employee Workplaces, 2004 edition*).

Only qualified persons shall perform tasks such as ***testing, troubleshooting, voltage measuring, etc. within the Limited Access Boundry (LAB)*** of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists. If a qualified employee needs to get closer to a live electrical line than is allowed for in this table, additional precautions, such as the use of rubber insulated gloves and eye & face protection will be used to protect the employee. The PPE used will be adequate for the voltages present.

ALL SUCH WORK WILL REQUIRE A SAFE WORK PERMIT AS OUTLINED ABOVE.

Emergency Evacuation

Evacuation Procedures

Evacuation with an Alarm

An evacuation may be authorized and initiated through the facility alarm system. When you hear the alarm sound you will also see strobe lights and hear an audible announcement requesting you to vacate the facility. You should stop what you are doing and proceed to the nearest exit. Unless told otherwise over the emergency P.A. system you should walk to the closest evacuation area.

***SEE EVACUATION ASSEMBLY AREA (next page)**

PLEASE DO NOT USE THE RADIOS OR TELEPHONES TO CALL AND ASK IF THE ALARM IS REAL. You should treat all alarms as real and begin evacuation procedures immediately. It is imperative that communications be maintained throughout an emergency. The two-way radio traffic and the telephone must be clear and only used by Security to report emergencies such as gas leaks, injuries, Fires, etc.

Evacuation without an Alarm

A situation may arise to evacuate the building without the use of the alarm system such as a bomb threat. If this situation occurs, Security will use one of the following procedures to notify patrons and employees of the evacuation:

- Public address system (PA) Located in the Security Office through the Fire detection system.
- Two-way radios
- Bull-horns—Located in the Security Office

The following announcement will be made when using one of these methods of communication:

"May I have your attention please…? We have an emergency developing in the building. Please vacate the facility. Please do not run. Please walk to the nearest exit in an orderly manner. Do not use the elevators. Again, please walk to the nearest exit in an orderly fashion and remain calm." You will be notified when it is all clear to come back. Thank you.

An announcement will be repeated, as necessary.

Due to public safety concern that could result from a building evacuation, the decision to evacuate the facility under a non-alarm situation should be carefully considered before implementing.

In a non-alarm emergency situation, the decision to authorize or override a facility evacuation is made by the Emergency Response Team. The Emergency Response Team includes the General Manager or Her / His designee or the Incident Commander of the Fire Department.

Evacuation Assembly Areas

Evacuation locations for the Salt Palace Convention Center

Area 1: The South Plaza, located at the corner of 200 South and West Temple

Area 2: North Plaza area Radisson Hotel

Evacuation locations for the South Towne Exposition Center

Area 1: Hart Plaza near Princess Cruise Boat (East of Building)

Area 2: The "Wedding Cake" near Riverwalk (West of the Building)

Reminder for Managers and Lead Supervisors

- **See Emergency Text Alert Process**
- Department managers or lead supervisors on duty should monitor radio communications and proceed to evacuation assembly areas outside the facilities.
- Once at the assembly location the lead supervisor or senior employee will begin to conduct a count of the employees in their department and verify which of their staff are present or not present and report that information to Security.
- All staff will continue to monitor radio communications and wait for further instructions.
- **Do Not Leave the assembly area unless the assembly area poses a danger or instructed to do so by the highest-ranking representative of the Emergency Response Team.**

Emergency Text Process

This system was created to:

1. Alerts show the facility staff of any incidents that occur during an event or otherwise which are considered to be of a crisis nature.

2. Alert key facility staff so they can respond appropriately to incidents involving attendees or staff.

3. Disperse information necessary to share via the text alert system.

Building-Wide
If there is an incident in the building that affects everyone – i.e., Evacuation, active shooter, bomb threat, fire, or severe weather – then the Emergency Text Alert system will take precedence over the show-specific alert system. Concurrent with the Text alerts, the P/A system and fire system warning lights will be activated. Emergency protocols will be followed.

Process
A dedicated text message alert system should be initiated by the highest-ranking Manager or supervisor on duty, however, may be initiated by any employee that is issued a company cell phone and has first knowledge of the crisis.

Messages will be sent to the following:
- General Manager
- Facility Directors
- All Department Managers
- Event Manager of each event
- Show Manager and/or designees (optional)

Show managers will be asked if they want to participate in the notification system by their Event Manager. The Show Manager will also be reminded of this service at the Pre-con.

LEVEL OF ALERT

Building-Wide
If there is an incident in the building that affects everyone – i.e., Evacuation, active shooter, bomb threat, fire, or severe weather – then the Emergency Text Alert system will take precedence over the show-specific alert system. Concurrent with the Text alerts, the P/A system and fire system warning lights will be activated. Emergency protocols will be followed.

SUGGESTED TEXT LANGUAGE
[Note: Texts must contain fewer than 160 characters – so be brief in writing descriptions.]

Ergonomics

PURPOSE

TCF employees do not have a high risk of back or other ergonomic related injuries. However, in keeping with ASMG's policy to implement best practice, this program has been created to support this low risk environment with basic and common sense, practical steps to reduce such injuries.

ERGONOMICS PROGRAM

ASM Global employees at TCF Center do not have a high risk of back or other ergonomic related injuries. However, in keeping with ASM Global's policy to implement best practice, this program has been created to support this low risk environment with basic and common sense, practical steps to reduce such injuries.

RESPONSIBILITY

The Director of Human Resources is responsible for adherence to this program.

THINGS TO LOOK FOR – POTENTIALLY UNSAFE CONDITIONS

Manual material handling tasks may expose workers to physical risk factors. If these tasks are performed repeatedly or over long periods of time, they can lead to fatigue and injury. The main risk factors, or ***conditions,*** associated with the development of injuries in manual material handling tasks include:

- Awkward postures (e.g., bending, twisting)
- Repetitive motions (e.g., frequent reaching, lifting, carrying)
- Forceful exertions (e.g., carrying or lifting heavy loads)
- Pressure points (e.g., grasping [or contact from] loads, leaning against parts or surfaces that are hard or have sharp edges)
- Static postures (e.g., maintaining fixed positions for a long time)

Repeated or continual exposure to one or more of these factors initially may lead to fatigue and discomfort. Over time, injury to the back, shoulders, hands, wrists, or other parts of the body may occur. Injuries may include damage to muscles, tendons, ligaments, nerves, and blood vessels. Injuries of this type are known as musculoskeletal disorders (MSD).

COMMON SENSE STEPS TO REDUCE LIFTING INJURIES

Plan the workflow to eliminate unnecessary lifts.

- Organize the work so that the physical demands and work pace increase gradually.
- Minimize the distances loads are lifted and lowered.
- Position pallet loads of materials at a height that allows workers to lift and lower within their power zone.
- Avoid manually lifting or lowering loads to or from the floor.
- Store materials and/or products off the floor.
- Arrange materials to arrive on pallets and keep materials on pallets during storage.
- Use a forklift to lift or lower the entire pallet of material, rather than lifting or lowering the material individually.
- Arrange to have material off-loaded directly onto storage shelves.
- Store only lightweight or infrequently lifted items on the floor.
- Use mechanical devices (e.g., lifts, hoists) whenever possible.
- Avoid designing jobs that require workers to lift or lower materials to or from floor level.

For loads that are unstable and/or heavy:

- Tag the load to alert workers.

- Test the load for stability and weight before carrying the load.
- Use mechanical devices or equipment to lift the load.
- Reduce the weight of the load by:
- Putting fewer items in the container.
- Using a smaller and/or lighter-weight container.
- Repack containers so contents will not shift, and the weight is balanced.
- Use team lifting as a temporary measure for heavy or bulky objects.
- Reduce the frequency of lifting and the amount of time employees perform lifting tasks by rotating workers in lifting tasks with other workers in non-lifting tasks.
- Having workers alternate lifting tasks with non-lifting tasks.
- Clear spaces to improve access to materials or products being handled. Easy access allows workers to get closer and reduces reaching, bending, and twisting.

MAKE IMPROVEMENTS

The goal of making changes is to ***improve the fit*** between the demands of work tasks and the capabilities of your workers. Combine operations and processes whenever possible to reduce or eliminate unnecessary manual handling of materials and products. *Depending on the characteristics of the work and the workers, there may be some changes that will improve a particular task*. If you need additional help with improvements, consider the following:

• **Talk to various employees**. Brainstorming with engineers, maintenance personnel, managers, and operational workers is a great way to generate ideas.

• **Contact others in your industry**. They may have solutions that could also apply to your problem, saving you time, money, and effort.

• **Look through equipment catalogs**. Focus on equipment dealing with the types of problems you are trying to solve.

• **Talk to equipment vendors**. They may be able to share ideas from operations similar to yours.

• **Consult with an expert in ergonomics, if necessary**. An expert can provide insights into available improvements, the cost, and the potential value.

• **Search the Internet** (e.g., Material Handling Industry of America, www.mhia.org, Material Handling Equipment
Distributors Association, www.mheda.org).

• **Annual on-line safety training.** *Provides basic, common sense, practical and safe techniques to reduce such injuries*

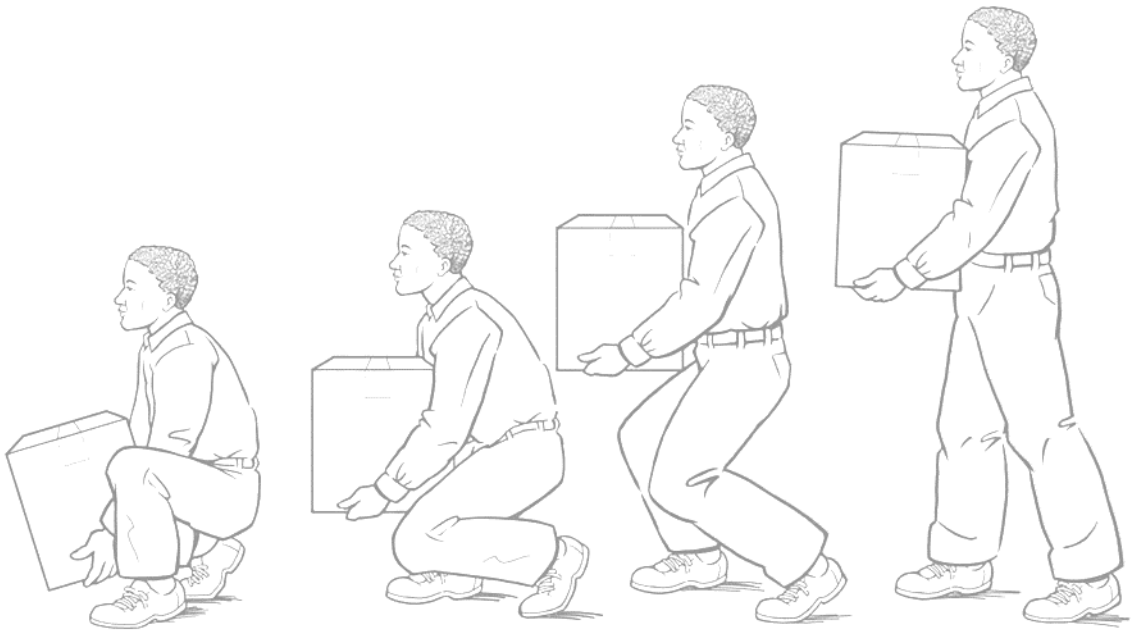
TOOLS

When ordering new hand tools, purchase those tools with ergonomic designs to reduce fatigue and the power necessary to use the tools.

LIFTING TECHNIQUE

BEND YOUR KNEES – KEEP YOUR BODY CLOSE TO THE OBJECT - BE SURE TO GET A GOOD HANDHOLD

LIFT WITH YOUR LEGS – NOT YOUR BACK



Excellent Resource for more information on preventing back injuries:
http://www.lni.wa.gov/IPUB/417-129-000.pdf

DO NOT

Lift while reaching or stretching.

Lift from an uncomfortable posture

DO NOT

Twist and Lift

Lift with one hand

Lift load across obstacles

DO

- Communicate to your co-worker when you are ready
- Get close to the object
- Lift slowly together
- Use your legs to lift
- Do not twist

OFFICE ERGONOMICS

Excellent resource for comprehensive information on typical ergonomic issues in the office environment can be found at: http://www.lni.wa.gov/IPUB/417-133-000.pdf

OFFICE CHAIRS – ERGONOMICS

- The backrest should conform to the natural curvature of your spine and provide adequate lumbar support.
- The seat should be comfortable and allow your feet to rest flat on the floor or footrest.
- Armrests, if provided, should be soft, allow your shoulders to relax and your elbows to stay close to your body.
- The chair should have a five-leg base with casters that allow easy movement along the floor.

Seat height. Office chair seat height should be easily adjustable. A pneumatic adjustment lever is the easiest way to do this. A seat height that ranges from about 16 to 21 inches off the floor should work for most people. This allows the user to have his or her feet flat on the floor, with thighs horizontal and arms even with the height of the desk.

Seat width and depth. The seat should have enough width and depth to support any user comfortably. Usually 17-20 inches wide is the standard. The depth (from front to back of the seat) needs to be enough so that the user can sit with his or her back against the backrest of the ergonomic office chair while leaving approximately 2 to 4 inches between the back of the knees and the seat of the chair. The forward or backward tilt of the seat should be adjustable.

- **Lumbar support**. Lower back support in an ergonomic chair is very important. The lumbar spine has an inward curve and sitting for long periods without support for this curve tends to lead to slouching (which flattens the natural curve) and strains the structures in the lower spine. An ergonomic chair should have a lumbar adjustment (both height and depth) so each user can get the proper fit to support the inward curve of the lower back.

- **Backrest**. The backrest of an ergonomic office chair should be 12 to 19 inches wide. If the backrest is separate from the seat, it should be adjustable in height and angle. It should be able to support the natural curve of the spine, again with special attention paid to proper support of the lumbar region. If the office chair has the seat and backrest together as one piece, the backrest should be adjustable in forward and back angles, with a locking mechanism to secure it from going too far backward once the user has determined the appropriate angle.

- **Seat material**. The material on the office chair seat and back should have enough padding to be comfortable to sit on for extended periods of time. Having a cloth fabric that breathes is preferable to a harder surface.

To set up a computer workstation, it is helpful to understand the concept of neutral body positioning. This is a comfortable working posture in which your joints are naturally aligned. Working with the body in a neutral position reduces stress and strain on the muscles, tendons, and skeletal system and reduces your risk of developing a musculoskeletal disorder (MSD). The following are important considerations when attempting to maintain neutral body postures while working at the computer workstation:

- **Hands**, **wrists**, and **forearms** are straight, in-line and roughly parallel to the floor.
- **Head** is level or bent slightly forward, forward facing, and balanced. Generally, it is in-line with the **torso**.
- **Shoulders** are relaxed and **upper arms** hang normally at the side of the body.
- **Elbows** stay in close to the body and are bent between 90 and 120 degrees.
- **Feet** are fully supported by the floor or a footrest may be used if the desk height is not adjustable.
- **Back** is fully supported with appropriate lumbar support when sitting vertical or leaning back slightly.
- **Thighs** and **hips** are supported by a well-padded seat and generally parallel to the floor.
- **Knees** are about the same height as the hips with the **feet** slightly forward.

Regardless of how good your working posture is, working in the same posture or sitting still for prolonged periods may cause discomfort or other issues. You should change your working position frequently throughout the day in the following ways:

- Make small adjustments to your chair or backrest.
- Stretch your fingers, hands, arms, and torso.

Stand up and walk around for a few minutes, periodically.

Armrests. Office chair armrests should be adjustable. They should allow the user's arms to rest comfortably and shoulders to be relaxed. The elbows and lower arms should rest lightly, and the forearm should not be on the armrest while typing.

Swivel. Any conventional style or ergonomic chair should easily rotate so the user can reach different areas of his or her desk without straining

Fall Protection

PURPOSE

TCF Center has a significant variety of potential situations where fall protection is needed. The use of portable ladders, platforms, roofing work, scissor lifts, tubular welded scaffolding and rigging may require the use of fall protection gear or equipment. This plan provides general guidance and is not intended to replace any specifically required OSHA programs. Its purpose is to enhance worker and management awareness of the need for fall protection for various tasks commonly performed at TCF Center. For example, for ladders, please see ASM Global's ladder safety program.

RESPONSIBILITY

Preventing a fall is everyone's responsibility. However, the site Facilities Manager has primary responsibility for ensuring that safe work practices are followed, that personal fall arrest systems are adequate and used properly and that employees are properly trained.

PLAN AHEAD

When working from heights, such as ladders, scaffolds, and roofs, TCF Center Management must plan projects to ensure that the job is completed safely. Begin by deciding how the job will be performed, what tasks will be involved, and what safety equipment may be needed to complete each task.

When estimating the cost of a job, TCF Center Management should include safety equipment, and plan to have all the necessary equipment and tools available at the job site. For example, in a roofing job, think about all of the different fall hazards, such as holes or skylights and leading edges, then plan and select fall protection suitable to do that work, such as personal fall arrest systems (PFAS).

PROVIDE THE RIGHT EQUIPMENT

Workers who are four or more feet above lower levels are at risk for serious injury or death if they should fall. To protect these workers, ASM Global must provide fall protection and the right equipment for the job, including the right kinds of ladders, scaffolds, and safety gear.

Different ladders and scaffolds are appropriate for different jobs. Always provide workers with the kind they need to get the job done safely. There are many ways to prevent falls during roof work. If workers use personal fall arrest systems (PFAS), provide a harness for each worker who needs to tie off to the anchor. Make sure the PFAS fits and regularly inspect all fall protection equipment to ensure it is still in good condition and safe to use.

GENERAL FALL PREVENTION REQUIREMENTS

Falls are among the most common causes of serious work-related injuries and deaths. ASM Global must set up the workplace to prevent employees from falling off of overhead platforms, falling from scaffolds, elevated workstations or into holes in the floor and walls.

What can be done to reduce falls?

TCF Center / ASM Global must take steps to prevent employees from falling off of overhead platforms, elevated workstations or into holes in the floor and walls. OSHA requires that fall protection be provided at elevations of four feet in general industry and at six feet when performing construction type work. In addition, OSHA requires that fall protection be provided when working over dangerous equipment and machinery, regardless of the fall distance.

To prevent employees from being injured from falls, TCF Center / ASM Global must:

- Guard every floor hole into which a worker can accidentally walk (using a railing and toe-board or a suitable floor hole cover).
- Provide a guard rail around every elevated open sided platform, floor, or runway.
- Regardless of height, if a worker can fall into or onto dangerous machines or equipment (such as a vat of acid, a conveyor belt, or other types of equipment) ASM Global must provide guardrails and toe-boards to prevent workers from falling and getting injured.
- Other means of fall protection that may be required on certain jobs include safety harness and lanyard, safety nets, guardrails, restraint systems, stair railings and handrails.
- Follow ASM Global’s ladder safety program

TRAINING

Falls can be prevented when workers understand proper set-up and safe use of equipment, so they need training on the specific equipment they will use to complete the job. A “competent” person must train employee(s) in hazard recognition and in the care and safe use ladders, scaffolds, personal fall protection systems, monitoring and warning line systems and other equipment and procedures they'll be using at TCF Center to prevent fall hazards.

COMPETENT PERSON and QUALIFIED PERSON

The term "Competent Person" is used in many OSHA standards and documents. An OSHA "competent person" is defined as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them".

By way of training and/or experience, a competent person is knowledgeable of applicable standards, is capable of identifying workplace hazards relating to the specific operation and has the authority to correct them.

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

"Qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

NOTE: In a *different context*, the term "qualified" also means a person with knowledge and experience working with electrical systems under OSHA's electrical standards and who has been trained in safety work practices

These definitions provide that a **competent person must have authority** to take **prompt measures** to eliminate hazards at the work site and have the experience to be capable of identifying these hazards.

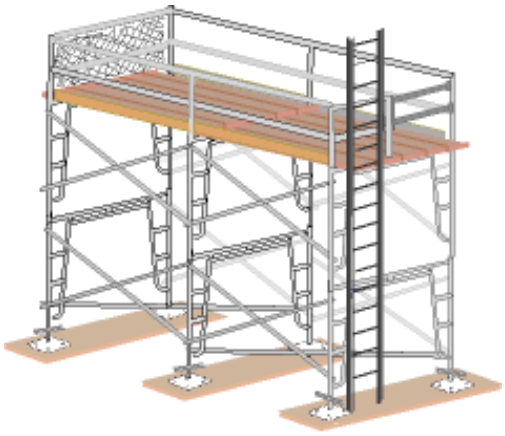
The definitions provide that a **qualified person must have** a recognized degree, certificate, etc., or extensive experience and ability to solve the subject problems, at the worksite. This is the reason why OSHA requires that supporting systems e.g., tie-off points design for fall protection shall be by a **qualified person. There may be a requirement for more technical or engineering knowledge here. Typically, a Professional Engineer is a qualified person.**

Example Denoting Qualified vs Competent– attachment points for a riggers horizontal life line, the strength of the life line itself and the number of employees safely able to hook up to that lifeline would typically be determined by a "qualified" person while the "competent" person would ensure that the already safely designed horizontal life line, connection points and the lanyards and harnesses are in good condition, properly used and maintained. However, depending upon education, training, and experience one person could be considered both competent and qualified simultaneously. A professional civil engineer would be a qualified person for the design of a PFAS at an arena or convention center.

SCAFFOLDING

Tubular welded frame, also known as fabricated frame scaffolds, is the type of scaffolding most commonly rented and used by TCF Center. Although these scaffolds may be used for general industry type work, ASM Global will follow the requirements of 1910.451.

- A fabricated frame scaffold (tubular welded frame scaffold) is a supported scaffold consisting of a platform(s) supported on fabricated end frames with integral posts, horizontal bearers, and intermediate members (see Figure below).



- All tubular welded frame scaffolds shall be erected by **competent and experienced** personnel.
- Frames and accessories for scaffolds shall be maintained in good repair and every defect, unsafe condition, or noncompliance with this section shall be immediately corrected before further use of the scaffold. Any broken, bent, excessively rusted, altered, or otherwise structurally damaged frames or accessories shall not be used.
- Periodic inspections shall be made of all welded frames and accessories, and any maintenance, including painting, or minor corrections authorized by the manufacturer, shall be made before further use.
- Frames and panels must be supported by cross, horizontal or diagonal braces, or a mixture of braces, to stabilize vertical members. Cross braces should be long enough to square and align vertical members, to produce an erect scaffold that is plumb, level, and square. Brace connections must be securely fastened. Frames and panels must be connected vertically by coupling, stacking pins, or equal means. Brackets supporting cantilevered loads must be seated with side-brackets parallel to the frames and end-brackets at 90 degrees to the frames. If loads are to be placed on a platform extension, the scaffold must be restrained from tipping and putlogs or knee brace extensions must be used. (Excessive loads on side brackets could cause a frame leg failure.) Existing platforms must be left in place until new end frames have been placed and braced, prior to moving the platforms to the next level. Scaffolds over 125 feet high must be designed by a registered professional engineer and be constructed and loaded consistent with the design.
- Metal tubular frame scaffolds, including accessories such as braces, brackets, trusses, screw legs, ladders, etc., shall be designed and proved to safely support four times the maximum intended load.
- Scaffolds shall be fully planked
- Only scaffold grade planking shall be used on scaffolding
- Only planks that are free from defects shall be used on scaffolding
- Spacing of panels or frames shall be consistent with the loads imposed.

- Scaffolds shall be properly braced by cross bracing or diagonal braces, or both, for securing vertical members together laterally, and the cross braces shall be of such length as will automatically square and align vertical members so that the erected scaffold is always plumb, square, and rigid. All brace connections shall be made secure.
- Scaffold legs shall be set on adjustable bases or plain bases placed on mud sills or other foundations adequate to support the maximum intended load.
- The frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alignment of the legs.
- Where uplift may occur, panels shall be locked together vertically by pins or other equivalent suitable means.
- Guardrails not less than 2 x 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- x 4-inch lumber or equivalent, and toe boards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toe boards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a) (17) of 1926.451.
- All tubular metal scaffolds shall be constructed and erected to support four times the maximum intended loads. The rated load of the scaffold must be known by ASM Global before it is rented.
- To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically.
- Planking and Maximum permissible spans of planking shall be in conformity with Allowable Span Table at http://www.osha.gov/SLTC/etools/scaffolding/planking.html.
- Drawings and specifications for all frame scaffolds over 125 feet in height above the base plates shall be designed by a registered professional engineer and copies made available to the ASM Global and for inspection purposes.

OVERVIEW OF OSHA FALL PROTECTION REQUIREMENTS

General industry: Operations and maintenance; trigger height = **4 ft.** above walking/working surface.

Construction: Construction, alterations, modifications, demolition, roofing, painting; trigger height = **6 ft.** above walking/ working surface.

NOTE: ASM Global employees who are performing construction work as defined by OSHA are covered by OSHA's construction standards in 29 CFR 1926. Physical alterations, improvements and refurbishing as opposed to preventative maintenance is covered under OSHA's construction standard.

Horizontal distance: Without fall protection—from unprotected edge = 50 ft. minimum.

Free-fall distance: Never exceeds 6 ft.

Safety monitor: (Low slope or flat roof) Roofing work only, roof > 50 ft. requires warning line at 6 ft., monitor to edge.

Guardrails, parapets: 39-45 in. high; withstand 200 lb. at top rail; guardrails must have mid-rail and toe boards if tools, material can fall to lower level.

Guardrail Materials: Constructed of minimum 500-lb strength material (no barrier tape). Pipe 1½ inch
minimum; Wood 2 x 4 inches minimum; two cables minimum ¼-inch diameter, top cable flagged at 6-ft intervals, no deflection under pressure below 39 inches.

Skylights: Skylights are typically not designed to support a worker's weight. They must be protected by a guardrail; or fall restraint/fall arrest; warning line systems.

Warning line systems: Low slope roofs only. General industry standard requires a "Designated Area"— minimum 6 ft. from unprotected edge. Construction— "Nonconforming Guardrail"— minimum 15 ft. from unprotected edge. System requirements—uprights withstand 16-lb force at 30-inches height; line to be rope, wire of 500-lb tensile strength, flagged at 6-ft intervals; height 34-39 inches; line attached to uprights with no line slip.

Fall restraint: Worker's center of gravity cannot fall over the unprotected edge in any direction. Lanyard/rope = 3,000 lb.; body belt or full body harness; anchor = 2 x force exerted, or 3,000 lb.

Personal fall arrest: Basic system = full-body harness plus a 6 ft. shock-absorbing lanyard attached to a 5,000 lb. anchorage (per person); minimum clearance = 17.5 ft. total length of clearance. This includes (6-ft lanyard, 3.5 ft. shock absorber, 5 ft. surface to dorsal D-ring, 1 ft. harness stretch, 2 ft. safety factor – SEE DIAGRAM BELOW).

Horizontal lifeline: (Designed by qualified person) minimum clearance to next level below or floor is 17.5 ft. PLUS lifeline stretch.

Vertical lifeline: 5,000-lb anchor (only one worker per lifeline) for clearance add 1 ft. for rope grab to activate, minimum clearance = 7.5 ft. + lanyard length.

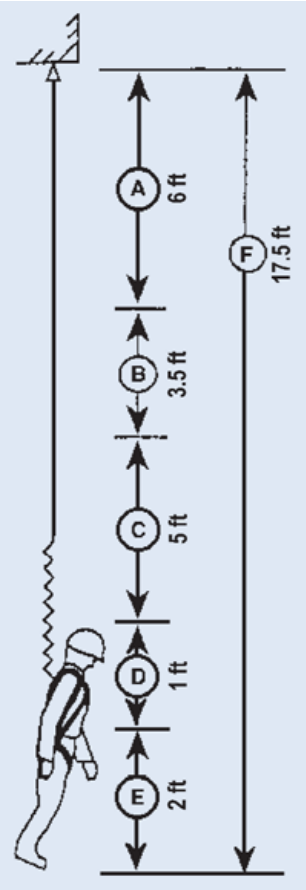
Ladder climbing devices: Maximum 9-in. connector between the ladder safety device and a front (chest) D-ring, engineered support. Must limit fall distance to 2 ft. or less.

Rescue planning: Prompt rescue is required. A plan must be in place and the rescue rehearsed to prevent the danger of suspension trauma.

All PFAS must account for the fall distance. The distance to the level below must never be less than the fall distance. See Diagram Below

Required Clearance

A. Free Fall - Max. 6 ft.
B. Deceleration Distance – 42 in.
C. Dorsal D-Ring Height
D. Harness Stretch
E. Safety Factor
F. Total Clearance Required



Rescue Planning:

When creating a successful fall rescue plan, the following 10 key elements must be considered.

1) **Areas of risk.** Before drafting a fall rescue plan, managers and supervisors should implement a hazard analysis to determine key areas of risk. These areas will be specifically addressed in the plan to ensure that employees are aware of the risks and the proper procedures to rescue workers from these situations.

2) **On-site preventive measures**. The best way to avoid a fall and subsequent rescue is to prevent it from happening. Installing guardrails, warning lines or fall restraint systems can be an easy step to prevent falls.

3) **Rescue systems**. For a fall protection system to be effective, workers must understand how the rescue system works in all contingencies. Taking the time to adequately educate workers on the proper use of the various rescue systems in varying circumstances can save time and reduce additional injuries from suspension trauma.

4) **Cost effectiveness**. When creating a fall protection and rescue plan, it is generally a far more cost-effective approach to make the investment in industrial rescue systems that are simple, pre-packed and pre-engineered versus the traditional technical rescue approach with a bag of rope, handful of carabineers and pulleys.

5) **Training**. By using pre-engineered systems, the training becomes much simpler, safer, and quicker should a rescue be required. ANSI Z359 now requires that a competent rescuer be trained annually and demonstrate his/her proficiency.

6) **Timeliness**. ASM Global must pay specific attention to the time it will take to reach a fallen worker. Within OSHA 1910.151, Medical Aid, the regulation uses the word "prompt," which is supported by a letter of interpretation that clarifies "prompt" as being able to provide medical aid within 4 minutes if there is a potential for injury or 15 minutes if the program administrator deems that no potential exists for injury to the fallen worker.

7) **Simple and safe.** Within the rescue plan, consideration should be given to the following elements: self-rescue, assisted self-rescue, incorporation of suspension trauma straps and mechanically aided rescue. As a last resort, the rescue should incorporate intervention by a competent rescuer, which requires the rescuer to be placed in danger by being lowered to the worker and performing a rescue pick-off.

8) **Rescue services**. In certain situations, rescue services will be able to reach a fallen employee more safely than other site workers. If outside rescue services are to be used, they should be briefed on the fall rescue plan so that they can assist in a rescue in the best way possible.

9) **Incident reporting**. To better prevent future falls or injuries, the plan should address incident and near-hit reporting. A competent person should take responsibility for reporting these incidents in a timely, appropriate manner so that changes or corrections can be made to equipment, risk, and procedures on the jobsite.
10) **Compliance**. Even a well-planned fall rescue program will fail if personnel on the job do not use the equipment or do not use it correctly. Motivating workers to be compliant with equipment and procedures will maintain jobsite safety and will be a tremendous asset in the event of a rescue. Creating a fall protection and rescue plan can seem a daunting task. By taking these 10 elements into account, however, managers can develop and implement a plan, should the need for rescue arise, that allows employees to do their jobs while also ensuring everyone's safety.

ASM Global Riggers are provided fall protection trained through their Union. ASM Global does not directly oversee this training. However, the training received during the apprenticeship of a Union rigger is generally accepted as meeting all applicable OSHA requirements as these riggers and their work is highly specialized. TCF Center does provide specific aerial lift training that all personnel must graduate from in order to operate an aerial lift within the facility.

SCISSOR LIFTS

TCF Center uses scissor lifts to access elevated areas to hang murals, banners, and access lighting fixtures. PFAS are not required in these elevated platforms *provided* the employees do not climb

onto the standard guardrails to access higher elevations or to access a piece of equipment not within their unaided reach**.**

ROOF WORK

All roof work that involves more than inspection(s) will be contracted to roofing contractors well versed in OSHA's fall protection for roofing work under 29 CFR 1910/1926. ASM Global will specify that such contractors implement fall protection that meets or exceeds OSHA requirements. TCF Center / ASM Global employees will ensure that any flat roof work that entails exposure to the edge of the roof (within 25 ft.) will require fall protection in the form of warning systems and monitors.

Each employee engaged in roofing activities on low-slope roofs with unprotected sides and edges 6 feet (1.8 meters) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, personal fall arrest systems or a combination of a warning line system and guardrail system, warning line system and safety net system, warning line system and personal fall arrest system, or warning line system and safety monitoring system. On roofs 50 feet (15.24 meters) or less in width, the use of a safety monitoring system without a warning line system is permitted.

Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

- Flagged at not more than 6-foot (1.8 meters) intervals with high-visibility material.
- Rigged and supported so that the lowest point (including sag) is no less than 34 inches (or 0.9 meters) from the walking/working surface and its highest point is no more than 39 inches (or 1 meter) from the walking/working surface.
- Stanchions, after being rigged with warning lines, shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches (0.8 meters) above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge;
- The rope, wire, or chain shall have a minimum tensile strength of 500 pounds and after being attached to the stanchions, must support without breaking, the load applied to the stanchions as prescribed above.
- Shall be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over.

Warning lines shall be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line shall be erected not less than 6 feet (1.8 meters) from the roof edge parallel to the direction of mechanical equipment operation, and not less than 10 feet (3 meters) from the roof edge perpendicular to the direction of mechanical equipment operation.

When mechanical equipment is not being used, the warning line must be erected not less than 6 feet (1.8 meters) from the roof edge

Personal Fall Arrest Systems (PFSA)

PFAS equipment is routinely used by TCF Center trades personnel and riggers.

The new ANSI Z359.0-Z359.4 **2007** fall protection code sets new requirements for fall protection. Components affected by the changes in the new standard include full body harnesses, twin-leg lanyards, and snap-hook and carabineer connectors.

Older harnesses with front-mounted D-rings may not meet the new strength requirements for fall arrest as specified in the latest version of the standard. Older versions of snap hooks and carabineers will not have the high tensile strength of the connectors certified to the latest standard. They also may be more limited in their compatibility with other components of a personal fall arrest system, regardless of which version of the ANSI standard the other components may meet.

Consequently, ASM Global will ensure that all harnesses, lanyards, carabineers, and other PFAS equipment will be replaced as necessary to meets the new requirements of ANSI Z359-2007.

The following, as a minimum, will comprise the basic requirements of the inspection and maintenance program:

- Equipment manufacturer's instructions will be incorporated into the inspection and preventive maintenance procedures.
- All fall protection equipment will be inspected prior to each use, and a documented inspection at intervals not to exceed 6 months, or in accordance with the manufacturer's guidelines.
- The user will inspect his/her equipment prior to each use and check the inspection date.
- Any fall protection equipment subjected to a fall or impact load will be ***removed from service*** immediately and will be sent back to the manufacturer for recertification.
- Check all equipment for mold, damage, wear, mildew, or distortion.
- Hardware should be free of cracks, sharp edges, or burns.
- Ensure that no straps are cut, broken, torn, or scraped.

Equipment that is damaged or in need of maintenance will be tagged as **unusable**, **and will not be stored** in the same area as serviceable equipment

SUMMARY

In order for TCF Center to ensure a safe environment for all of its employees and subcontractors, the facility must ensure that those working directly for ASM Global, and those contracted to work at TCF Center are protected from falls using any feasible means including PFAS, guardrails, monitoring/warning line systems, restraint systems and safe work practices.

FALL PROTECTION RESOURCES FOR ARENAS – RIGGER SAFETY

http://www.evancorp.com/evanPage.cfm?sec=22&opt=108

http://www.fall-arrest.com/fall-arrest-systems/industrial-fall-protection/stadiums.asp

http://hysafe.com/arena-theater

Fire Extinguisher

BASIS: Over 150 major fires occur in workplaces on an annual basis. Fire is the third leading cause of accidental deaths in the United States. The Occupational Safety and Health Administration (OSHA) has established Federal regulations in 29 Code of Federal Regulation (CFR), §1910.157 for portable fire extinguishers and their use. OSHA has a general directive for employers to maintain a workplace free of hazards. Under authority of this directive, OSHA requires that "employers shall provide portable fire extinguishers and shall mount, locate, and identify them so that they are readily accessible to employees without subjecting employees to possible injury." OSHA requires that education and training be provided to employees as well.

1. Written Program. TCF Center Management will review and evaluate this standard practice instruction:

- On an annual basis
- When changes occur to 29 CFR, that prompt revision of this document
- When facility operational changes occur that require a revision of this document
- When there is an accident or close-call that relates to this area of safety
- Review the program any time these procedures fail

Effective implementation of this program requires support from all levels of management within TCF Center. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals and objectives.

2. Selection and Distribution. Portable fire extinguishers shall be provided for employee use and selected and distributed based on the classes of anticipated workplace fires and on the size and degree of the hazard which would affect their use. Fire extinguishers used by the venue are for four classes of fires:

Class A Fire Extinguishers. 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 Extinguishers. 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 Extinguishers. 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 Extinguishers. 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.

3. Labeling of Fire Extinguishers. All fire extinguishers used by TCF Center will be labeled in accordance with NFPA 10, Standard for Portable Fire Extinguishers. Locations where fire extinguishers are mounted will also comply with NFPA 10 for labeling purposes.

4. General Requirements: TCF Center Management has provided portable fire extinguishers for employee use in the event of an incipient fire. All fire extinguishers shall be mounted no higher and no lower than four (4) feet from the floor. The following key personnel have specific responsibilities.

A. Manager of Public Safety & Security

- Schedule the proper training for employees.
- Update the program when necessary.
- Record and maintain training records.

B. Facilities Manager

- Manage the Fire Extinguisher Program.
- Replace used and damaged fire extinguisher(s).
- Reporting to either the Manager of Public Safety & Security or his Designee that a fire extinguisher has been used or damaged.
- Ensure monthly/annual inspections are being conducted.

C. Department and First Line Supervisors

- Ensure all fire extinguishers are accessible.
- Ensure employees are aware of where extinguishers are located.
- Make sure extinguishers are clean and are free from obstructions.
- Report to the Manager of Public Safety & Security that a fire extinguisher has been used or damaged.

All fire extinguishers shall be maintained as follows:

- Numbered to identify their proper location (see attached eight (8) pages of floor plans)
- Fully charged and in operable condition
- Clean and free of defects
- Readily accessible at all times

Note: TCF Center staff will not use portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents. Portable fire extinguishers that have soldered or riveted shell self-generating soda acid or self-generating foam or gas cartridge water type portable fire extinguishers which are operated by inverting the extinguisher to rupture the cartridge or to initiate an uncontrollable pressure generating chemical reaction to expel the agent shall be removed from the facility permanently.

5. Master List of Fire Extinguishers

Reference eight (8) pages of floor plans dated 6-16-16)

6. Inspection, Maintenance, and Testing. TCF Center Management is responsible for the inspection, maintenance, and testing for all fire extinguishers on the premises.

TCF Center Management will assure that all portable fire extinguishers are subject to the following:

- Monthly visual inspections
- Annual maintenance check
- Six (6) year tear down maintenance
- Twelve (12) year hydrostatic test
- Extinguishers are promptly recharged
- Extinguishers are compatible

7. 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 and extinguishing the fire. Selected employees will be provided with an educational program to familiarize them with the general principles of fire extinguisher use and the hazards involved with incipient stage firefighting. Training will require annual updating to ensure the proper procedures are being followed.

Initial Training Outline

A. General principles of a fire.
B. Hazards employed with an incipient stage fire(s).
C. When to "back off" (evacuate) of an incipient stage fire(s).
D. General fire principles of a fire extinguisher.
E. Hazards employed with the use a fire extinguisher.
F. Use of a fire extinguisher (hands-on).

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:

- A change in job assignment.
- A change in machines, equipment or processes that present a new potential fire hazard.
- There is a change in the fire prevention procedures.
- Venue Management has reason to believe that there are deviations from or inadequacies in the employee's knowledge or 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 training provided.

Certification.
TCF Center Management shall certify that employee training has been accomplished and is being kept up to date.

Fire / Life Safety

In order to accomplish the goal of preventing injuries, saving lives, and protecting property, all employees will be trained in this information and be prepared to respond effectively when an emergency arises.

A Fire Prevention Program to ensure guest and employee safety and asset protection in a manner consistent with professional fire prevention management is critical to the success of TCF Center. The ASM Global managed TFC Center will ensure that potential fire hazards within the facility are evaluated. This standard practice and instruction are intended to comprehensively address the issues of evaluating and identifying potential fire hazards, providing proper exits, fire-fighting equipment, emergency plans, written procedures, and communicating information concerning these hazards to employees.

PURPOSE

This document serves as guidance to TFC Center. Its intent is to identify various important considerations surrounding patron and employee safety with respect to fire prevention and fire response and fire emergencies. It also serves to provide basic information specific to certain OSHA requirements addressing fire prevention and response. It is not intended, by itself, to be a completely comprehensive program.

TCF CENTER RESPONSE

TCF Center has drafted a separate fire prevention program specific for its venue and has implemented it accordingly. Please see this program for specific fire prevention policy. TCF Center has no fire brigade and it is not currently ASM Global policy for any of its employees to fight structural fires. TCF Center adheres to all local codes as determined and enforced by local fire officials including testing of firefighting equipment such as sprinkler systems. TCF Center expects only trained employees to use portable fire extinguishers to fight incipient stage fires and has provided training to implement this policy. TCF Center has installed emergency lighting on the overhead cat walks. This lighting is powered by emergency back- up batteries. This lighting is required by OSHA in the event of a power outage to allow riggers to safely exit the cat walks.

The Manager of Public Safety and Security will review this best practice document to ensure that any other applicable items are considered and implemented as required or as good practice dictates. TCF Center has fire evacuation plans that will be drilled and critiqued by the Manager of Public Safety and Security. The remainder of this document serves as an excellent overview of the requirements that may or may not have applicability to TFC Center.

ASM Global BEST PRACTICE FOR FIRE EMERGENCY & FIRE PREVENTION RESPONSE

DESCRIPTION

ASM Global at TCF Center will review and evaluate this standard practice instruction on an annual basis, when changes occur to 29 CFR 1910, or when facility operational changes occur that require revision. Effective implementation of this program requires support from all levels of management within the venue. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals and objectives.

ACTION PLAN

1. ASM Global/TCF Center must establish and maintain a written Fire Prevention Program
2. Emergency Notification Procedures
3. Warning and Evacuations Systems
4. Evacuation Procedures
5. Facility/Department Evaluation
6. Means of Egress
7. Fire Prevention Plan
8. Portable Fire Suppression Equipment
9. ASM Global Fire Prevention Policy
10. Fire Brigades
11. Locations/Types of Portable Fire Extinguishers
12. **Refer to Appendix A** (below) for ASM Global Fire Prevention Program
13. **Refer to Appendix B** (below) for Fire Prevention Safety Policy Statement

ADDITIONAL INFORMATION

OSHA- 29 CFR 1910.36
OSHA- 29 CFR 1910.38
OSHA- 29 CFR 1910.157
OSHA- 29 CFR 1910.165

END OF SECTION

DISCLAIMER

In an effort to provide a certain degree of consistency and coverage with regards to ASM Global's operational activities at TCF Center, these Best Practices have been developed for your use. These should not be considered to provide, in every instance, complete coverage nor shall these supersede City, County, State, Federal or Manufacture requirements as applicable.

APPENDIX A

SEE APPENDIX A – ASM Global FIRE PREVENTION PROGRAM

SEE APPENDIX B – FIRE PREVENTION SAFETY POLICY STATEMENT

APPENDIX A – ASM Global FIRE PREVENTION PROGRAM

BASIS: Over 150 major fires occur in workplaces on an annual basis. Fire is the third leading cause of accidental deaths in the United States. The Occupational Safety and Health Administration (OSHA) estimates that most of these accidents can be prevented if proper safety precautions at job sites are initiated. This poses a serious problem for exposed workers and their employer. The OSHA Fire Prevention Standards establish uniform requirements to ensure that fire hazards in U.S. workplaces are evaluated, safety procedures implemented, and that the proper fire prevention information is transmitted to all affected workers.

1. Written program. ASM Global Venues will review and evaluate this standard practice instruction on an annual basis, when changes occur to 29 CFR 1910, or when facility operational changes occur that require revision. Effective implementation of this program requires support from all levels of management within this venue. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Emergency notification procedures. The following services/agencies will be requested/notified in the event of a fire that cannot be contained through the use of portable fire extinguishers.

2.1 Routine notification/requests for assistance will be made by Venue Supervisors, Venue Management, or the Safety Designee. Any employee who cannot immediately contact a Supervisor, Management or the Safety Designee should immediately request assistance. This person should begin word-of-mouth evacuation notification then immediately evacuate.

On-Site Fire & Emergency Services Contacts.

Type of Service	Location	Contact Name	Phone Number

Federal, State, Local Fire & Emergency Services Agencies.

Type of Service	Location	Contact Name	Phone Number

The following types of warnings are intended as examples. Choose a consistent type of warning system for your fire prevention program.

3. Warning and evacuations systems. At the time of an emergency, employees should know what type of evacuation is necessary and what their role is in carrying out the plan. In some cases where the emergency is very grave, total, and immediate evacuation of all employees is necessary. In other emergencies, a partial evacuation of nonessential employees with a delayed evacuation of others may be necessary for continued venue operation. In some cases, only those employees in the immediate area of the fire may be expected to evacuate or move to a safe area such as when a local application fire suppression system discharge employee alarm is sounded. Employees must be sure that they know what is expected of them in all such emergency possibilities, which have been planned in order to provide assurance of their safety from fire or other emergency.

3.1 General requirements.

3.1.1 The employee alarm system shall provide warning for necessary emergency action as called for in the emergency action plan, or for reaction time for safe escape of employees from the workplace or the immediate work area, or both.

3.1.2 The employee alarm shall be capable of being perceived above ambient noise or light levels by all employees in the affected portions of the workplace. Tactile devices will be used to alert those employees in areas where they would not otherwise be able to recognize the audible or visual alarm.

3.1.3 The employee alarm shall be distinctive and recognizable as a signal to evacuate the work area or to perform actions designated under the venue emergency plan.

3.1.4 Venue Management shall explain to each employee the preferred means of reporting emergencies, such as manual pull box alarms, public address systems, radio, or telephones. Venue Management shall post emergency telephone numbers near telephones, or employee notice boards, and other conspicuous locations when telephones serve as a means of reporting emergencies. Where a communication

system also serves as the employee alarm system, all emergency messages shall have priority over all non-emergency messages.

3.1.5 Venue Management shall establish procedures for sounding emergency alarms in the workplace.

NOTE: Venues with 10 or fewer employees in a particular workplace, direct voice communication is an acceptable procedure for sounding the alarm provided all employees could hear the alarm. Such workplaces need not have a back-up system.

3.1.6 All employee alarm systems will be restored to normal operating condition as promptly as possible after each test or alarm. Spare alarm devices and components subject to wear or destruction shall be available in sufficient quantities and locations for prompt restoration of the system.

3.1.7 Maintenance and testing. Venue Management shall assure that all employee alarm systems are maintained in operating condition except when undergoing repairs or maintenance.

3.1.8 Test frequency. Venue Management shall assure that a test of the reliability and adequacy of non-supervised employee alarm systems is made every two months. A different actuation device shall be used in each test of a multi-actuation device system so that no individual device is used for two consecutive tests.

3.2 Types of warning systems. The following types of warning systems will be used by ASM Global to notify employees of a fire and the need to evacuate to the pre-designated evacuation relocation point.

The following are only examples; site must decide/determine the types of warning systems.

Facility Evacuation Warnings

Type Warning	Meaning	Duration	Test	Notes
Siren, Steady tone	Fire	5-10 Minutes	Quarterly	1,4,5
Metal Triangle	Fire	5-10 Minutes	Quarterly	2,5
Siren, Inter. tone	Tornado	5-10 Minutes	Quarterly	3,5
Whistles	Tornado	5-10 Minutes	Quarterly	2,5
Word-of-mouth	Any	N/A	Quarterly	All
Word-of-mouth	All Clear	N/A	Quarterly	All

Note 1. Evacuate immediately to the evacuation relocation point. Note 2. Used in the event primary siren system is not working. Note 3. Evacuate immediately to the tornado relocation points. Note 4. To be used in the event of in-plant chemical release. Note 5. Evacuate, begin roll call, and determine injured/missing.

4. Evacuation procedures. All employees will adhere to the following schedule for evacuation and relocation.

4.1 Facility Evacuation. The complete dispersal of all employees from the venue.

4.2 Department Evacuation. The dispersal of all employees from the appropriate department and surrounding departments of the affected area, in the case of a chemical spill, release or other safety and health concerns.

4.2.1 Fire Leads. Fire leads will be assigned to direct employees to the nearest unobstructed exit away from the emergency. In the event it is unclear whether Facility or Department evacuation was ordered. Facility evacuation will be assumed, and all personnel evacuated. The employees selected or who volunteer to serve, as leads will be trained in the complete workplace layout and the various alternative escape routes from the workplace.

4.2.1.1 Buddy system. All leads and fellow employees should be made aware of handicapped employees who may need extra assistance, such as using the buddy system, and of hazardous areas to be avoided during emergencies. Before leaving, leads should check rooms and other enclosed spaces in the workplace for employees who may be trapped or otherwise unable to evacuate the area.

4.2.2 Notification of department only evacuation. Notification of department only evacuation will be accomplished by Department Supervisor.

4.2.3 Supervisors will ensure that adequate numbers of employees are available at all times during working hours to act as evacuation leads so that employees can be swiftly moved from the danger location to the safe areas.

4.2.4 One lead for each twenty employees in the workplace will be designated.

4.2.5 After the desired degree of evacuation is completed, the leads will account that all employees are in the safe areas.

*Note: Need to establish fire leads for each department

4.3 Procedures. In the event the warning system is activated or if you are advised to evacuate the facility or department, follow the below listed guidelines. Above all use your common sense.

4.3.1 Panic kills; if you are calm it will help others.

4.3.2 Move quickly in the opposite direction of known hazards towards the nearest unobstructed exit.

4.3.3 Notify co-workers along the way, talk later.

4.3.4 Once outside relocate to the evacuation relocation point: Designated Area.

4.3.5 Report to your supervisor if he/she is present.

4.3.6 Senior employees will begin roll call immediately.

4.3.7 Notify senior management of missing, injured, deceased persons.

4.3.8 Don't forget facility visitors.

4.3.9 Refer media representatives to General Manager or Senior Building Manager.

The designation of refuge or safe areas for evacuation should be determined and identified in the plan. In a building divided into fire zones by firewalls, the refuge area may still be within the same building but in a different zone from where the emergency occurs. Exterior refuge or safe areas may include parking lots, open fields or streets which are located away from the site of the emergency and which provide sufficient space to accommodate the employees. Employees should be instructed to move away from the exit discharge doors of the building, and to avoid congregating close to the building where they may hamper emergency operations.

5. Facility/Department Evaluation. Venue Management will evaluate facility by department to determine where the potential for fuel and ignition sources is high and where ignition sources are present. When these two components are present the criteria required for designation, as a high-risk fire hazard area exists.

5.1 Information program. Those areas/jobs meeting the criteria for a high-risk fire hazard area or having a known potential to pose a hazard will be designated as high-risk fire hazard areas. Venue Management will inform exposed employees, by posting danger signs, conducting awareness training, or by any other equally effective means, of the existence and location of the hazard and the danger posed.

5.2 Equipment program. Suitable fire protection equipment will be provided, worn, and used where machines, operations, or processes present a fire hazard. Any situation that could provide an ignition source, fuel, or a combination of these hazards will be reviewed. When information indicating limitations or precautions is received from the manufacturer concerning fire hazards associated with equipment used by or belonging to the venue, they will be immediately transmitted to employees and care taken to see that such limitations and precautions are strictly observed.

5.3 High risk fire hazard area/job listing.

Department	Area/Job	Ignition Source	Date Evaluated

6. Means of Egress. ASM Global venues will meet as a minimum the basic building codes required for safety and health. This section details general fundamental requirements essential to providing a safe means of egress from fire and like emergencies.

6.1 Fundamental requirements.

6.1.1 Basic egress premise. Every building or structure, new or old, designed for human occupancy owned by this company will be provided with exits sufficient to permit the prompt escape of occupants in case of fire or other emergency. The design of exits and other safeguards will be such that reliance for safety or life in case of fire or other emergency will not depend solely on any single safeguard. Where required additional safeguards will be provided for life safety in case any single safeguard is ineffective due to some human or mechanical failure.

6.1.2 Design criteria. All buildings or structures will be so constructed, arranged, equipped, maintained, modified, and operated as to avoid undue danger to the lives and safety of our employees from fire, smoke, fumes, or resulting panic during the period of time reasonably necessary for escape from the building or structure in case of fire or other emergency.

6.1.3 Exit requirements. All buildings or structures will be provided with exits of kinds, numbers, location, and capacity appropriate to the individual building or structure, with due regard to the character of the occupancy, the number of persons exposed, the fire protection available, and the height and type of construction of the building or structure, to afford all occupants convenient facilities for escape.

6.1.4 All exits will be so arranged and maintained as to provide free and unobstructed egress from all parts of the building or structure at all times when it is occupied. It is understood that no lock or fastening device designed to prevent free escape from the inside of any building will be installed except in mental, penal, or corrective institutions where supervisory personnel is continually on duty and effective provisions are made to remove occupants in case of fire or other emergency.

6.1.5 Egress marking. Every exit will be clearly visible or the route to reach it will be conspicuously indicated in such a manner that every occupant of every building or structure who is physically and mentally capable will readily know the direction of escape from any point, and each path of escape, in its entirety, will be so arranged or marked that the way to a place of safety outside is unmistakable. Any doorway or passageway not constituting an exit or way to reach an exit, but of such a character as to be subject to being mistaken for an exit, will be so arranged or marked as to minimize its possible confusion with an exit and the

resultant danger of persons endeavoring to escape from fire finding themselves trapped in a dead-end space, such as a cellar or storeroom, from which there is no other way out.

6.1.6 Illumination requirements. In every building or structure equipped for artificial illumination, adequate and reliable illumination will be provided for all exit locations. Exit signs will be installed at the point of exit from the building.

6.1.7 In every building or structure of such size, arrangement, or occupancy that a fire may not itself provide adequate warning to occupants, fire alarm facilities will be provided where necessary to warn occupants of the existence of fire so that they may escape, or to facilitate the orderly conduct of fire exit drills.

6.1.8 Every building or structure, section, or area thereof of such size, occupancy, and arrangement that the reasonable safety of numbers of occupants may be endangered by the blocking of any single means of egress due to fire or smoke, will have at least two means of egress remote from each other, so arranged as to minimize any possibility that both may be blocked by any one fire or other emergency conditions.

6.1.9 It is understood that compliance with these requirements will not be construed as eliminating or reducing the necessity for other provisions for safety of persons using a structure under normal occupancy conditions, or requiring or permitting any condition that may be hazardous under normal occupancy conditions.

6.1.10 Protection of employees exposed by construction and repair operations.

6.1.10.1 No building or structure managed by ASM Global under construction will be occupied in whole or in part until all exit facilities required for the part occupied are completed and ready for use.

6.1.10.2 No existing building will be occupied during repairs or alterations unless all existing exits and any existing fire protection are continuously maintained, or in lieu thereof other measures are taken which provide equivalent safety.

6.1.10.3 No flammable or explosive substances or equipment for repairs or alterations will be introduced in a building of normally low or ordinary hazard classification while the building is occupied, unless the condition of use and safeguards provided are such as not to create any additional danger or handicap to egress beyond the normally permissible conditions in the building.

6.2 Maintenance. All required exits, ways of approach thereto, and ways of travel from the exit into the street or open space, will be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

6.2.1 Every automatic sprinkler system, fire detection and alarm system, exit lighting, fire door, and other item of equipment, where provided, will be continuously in proper operating condition.

6.3 Discharge from exits.

6.3.1 Venue Management will ensure that all exits will discharge directly to the street, or to a yard, court, or other open space that gives safe access to a public way. The streets to which the exits discharge will be of width adequate to accommodate all persons leaving the building. Yards, courts, or other open spaces to which exits discharge will also be of adequate width and size to provide all persons leaving the building with ready access to the street.

6.3.2 Stairs and other exits will be so arranged as to make clear the direction of egress to the street. Exit stairs that continue beyond the floor of discharge will be interrupted at the floor of discharge by partitions, doors, or other effective means.

6.4 Headroom. Means of egress will be so designed and maintained as to provide adequate headroom, but in no case will the ceiling height is less than 7 feet 6 inches nor any projection from the ceiling be less than 6 feet 8 inches from the floor.

6.5 Changes in elevation. Where a means of egress is not substantially level, such differences in elevation will be negotiated by stairs or ramps.

6.6 Maintenance and workmanship.

6.6.1 Doors, stairs, ramps, passages, signs, and all other components of means of egress will be of substantial, reliable construction and will be built or installed in a workmanlike manner.

6.6.2 Means of egress will be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

6.6.3 Any device or alarm installed to restrict the improper use of an exit will be so designed and installed that it cannot, even in cases of failure, impede or prevent emergency use of such exit.

6.7 Furnishings and decorations.

6.7.1 No furnishings, decorations, or other objects will be so placed as to obstruct exits, access thereto, egress therefrom, or visibility thereof.

6.7.2 No furnishings or decorations of an explosive or highly flammable character will be used in any occupancy.

6.8 Automatic sprinkler systems. All automatic sprinkler systems will be continuously maintained in reliable operating condition at all times, and such periodic inspections and tests will be made

as are necessary to assure proper maintenance. Inspections will be conducted on a (local code compliant) basis.

Type System	Location/Serial #	Date Inspected	Inspector

6.9 Fire alarm signaling systems. Venue Management will assure that fire alarm signaling systems are maintained and tested in accordance with the requirements of 29 CFR 1910.165(d). The system will be tested every two months (OSHA mandated). A different actuation device will be used in each test of a multi-activation device system so that no individual device is used for two consecutive tests.

6.10 Fire retardant paints. Fire retardant paints or solutions will be renewed at such intervals as necessary to maintain the necessary flame retardant properties.

6.11 Exit marking.

6.11.1 Exits will be marked by a readily visible sign. Access to exits will be marked by readily visible signs in all cases where the exit or way to reach it is not immediately visible to the occupants.

6.11.2 Any door, passage, or stairway which is neither an exit nor a way of exit access, and which is so located or arranged as to be likely to be mistaken for an exit, will be identified by a sign reading “Not an Exit" or similar designation, or will be identified by a sign indicating its actual character, such as "To Basement," "Storeroom," "Linen Closet," or the like.

6.11.3 Every required sign designating an exit or way of exit access will be so located and of such size, color, and design as to be readily visible. No decorations, furnishings, or equipment which impair visibility of an exit sign will be permitted, nor will there be any brightly illuminated sign (for other than exit purposes), display, or object in or near the line of vision to the required exit sign of such a character as to so detract attention from the exit sign that it may not be noticed.

6.11.4 Every exit sign will be distinctive in color and will provide contrast with decorations, interior finish, or other signs.

6.11.5 A sign reading "Exit", or similar designation, with an arrow indicating the directions, will be placed in every location where the direction of travel to reach the nearest exit is not immediately apparent.

6.11.6 Every exit sign will be suitably illuminated by a reliable light source giving a value of not less than 5 foot-candles on the illuminated surface. Artificial lights giving illumination to exit signs other than the internally illuminated types will have screens, discs, or lenses of not less than 25 square inches area made of translucent material to show red or other specified designating color on the side of the approach.

6.11.7 Each internally illuminated exit sign will be provided in all occupancies where reduction of normal illumination is permitted.

6.11.8 Every exit sign will have the word "Exit" in plainly legible letters not less than 6 inches high, with the principal strokes of letters not less than three fourths of an inch wide.

7. Fire prevention plan. The following elements, at a minimum, will be included in the fire prevention plan:

7.1 A list of the major workplace fire hazards and their proper handling and storage procedures, potential ignition sources (such as welding, smoking and others) and their control procedures, and the type of fire protection equipment or systems, which can control a fire involving them.

7.2 Names or regular job titles of those personnel responsible for maintenance of equipment and systems installed to prevent or control ignitions or fires.

7.3 Names or regular job titles of those personnel responsible for control of fuel source hazards.

7.4 Housekeeping for fire prevention. Supervisors will control accumulations of flammable and combustible waste materials and residues so that they do not contribute to a fire emergency. The housekeeping procedures will be included in the written fire prevention plan.

7.5 Training.

7.5.1 Venue Management will apprise employees of the fire hazards of the materials and processes to which they are exposed.

7.5.2 Venue Management will review with each employee upon initial assignment those parts of the fire prevention plan which the employee must know to protect the employee in the event of an emergency.

7.6 Plan location. The written plan will be kept in the workplace and made available for employee review.

Note: For ASM Global venues with 10 or fewer employees, the plan may be communicated orally to employees and the employer need not maintain a written plan.

7.7 Maintenance. Venue Management will regularly and properly maintain, according to established procedures, equipment and systems installed on heat producing equipment to prevent accidental ignition of combustible materials. The maintenance procedures will be included in the written fire

prevention plan.

7.8 Equipment control devices. Employees and supervisors will be aware of the specific type of control devices on equipment involved with combustible materials in the workplace and should make sure, through periodic inspection or testing, that these controls are operable. Manufacturers' recommendations should be followed to assure proper maintenance procedures.

8. Portable Fire Suppression Equipment. The requirements of this section apply to the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees of venue employees (this section does not apply to extinguishers provided for use on the outside of workplace buildings or structures).

8.1 General requirements. Venue Management shall provide portable fire extinguishers and shall mount, locate, and identify them so that they are readily accessible to employees without subjecting the employees to possible injury.

8.2 Only approved portable fire extinguishers shall be used to meet the requirements of this section.

8.3 Venue Management shall not provide or make available in the workplace portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents. Any employee finding such an extinguisher should report the find to the Safety Designee.

8.4 Venue Management shall assure that portable fire extinguishers are maintained in a fully charged and operable condition and kept in their designated places at all times except during use.

8.5 Venue Management shall permanently remove from service all soldered or riveted shell self-generating soda acid or self-generating foam or gas cartridge water type portable fire extinguishers which are operated by inverting the extinguisher to rupture the cartridge or to initiate an uncontrollable pressure generating chemical reaction to expel the agent. Any employee finding such an extinguisher should report the find to the Safety Designee.

8.6 Selection and distribution. Portable fire extinguishers shall be provided for employee use and selected and distributed based on the classes of anticipated workplace fires and on the size and degree of hazard, which would affect their use.

> 8.6.1 Class A fires. Class A fires are classed as ordinary combustibles or fibrous material, such as wood, paper, cloth, rubber, and some plastics. Portable fire extinguishers for use by employees on Class A fires will be distributed so that the travel distance for employees to any extinguisher is
> 75 feet (22.9 m) or less.
>
> 8.6.2 Class B fires. Class B fires are classed as flammable or combustible liquids such as gasoline, kerosene, paint, paint thinners and propane. Portable fire extinguishers for use by employees on Class B fires will be distributed so that the travel distance from the Class B hazard area to any extinguisher is 50 feet (15.2 m) or less.

8.6.3 Class C fires. Class C fires are classed as energized electrical equipment, such as appliances, switches, panel boxes and power tools. Portable fire extinguishers for use by employees on Class C fires will be distributed so that the travel distance from the Class C hazard area to any extinguishing agent is 50 feet (15.2 m) or less.

8.6.4 Class D fires. Class D fires are classed as certain combustible metals, such as magnesium, titanium, potassium, and sodium. Portable fire extinguishers or other containers of Class D extinguishing agent used by employees will be distributed so that the travel distance from the combustible metal working area to any extinguishing agent is 75 feet (22.9 m) or less.

8.7 Inspection, maintenance, and testing. Venue Management shall be responsible for the inspection, maintenance and testing of all portable fire extinguishers used by venue.

8.7.1 Monthly inspections. Portable extinguishers or hoses used in lieu thereof will be visually inspected monthly and documented.

8.7.2 Annual maintenance check. Portable fire extinguishers will be subjected to an annual maintenance check and documented.

8.7.2.1 Venue Management shall record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less.

8.7.3 Hydrostatic testing. Venue Management shall assure that hydrostatic testing is performed by trained persons with suitable testing equipment and facilities. Alternate equivalent protection will be provided when portable fire extinguishers are removed from service for maintenance and recharging.

8.7.3.1 Test records. Venue Management shall maintain and provide upon request, evidence that the required hydrostatic testing of fire extinguishers has been performed at the time intervals shown in Table 1. Such evidence shall be in the form of a certification record, which includes the date of the test, the signature of the person who performed the test and the serial number, or other identifier, of the fire extinguisher that was tested. Such records shall be kept until the extinguisher is hydrostatically retested at the time interval specified in Table 1 or until the extinguisher is taken out of service, whichever comes first.

8.7.4 Dry chemical extinguishers. Venue Management shall assure that stored pressure dry chemical extinguishers that require a 12-year hydrostatic test are emptied and subjected to applicable maintenance procedures every 6 years. Dry chemical extinguishers having non- refillable disposable containers are exempt from this requirement. When recharging or hydrostatic testing is performed, the 6-year requirement begins from that date.

8.7.5 In addition to an external visual examination, an internal examination of cylinders and shells will be made prior to being tested or subjected to hydrostatic tests.

8.7.6 Portable extinguishers will be hydrostatically tested at the intervals listed in Table 1 of this section, except under any of the following conditions:

8.7.6.1 When the unit has been repaired by soldering, welding, brazing, or use of patching compounds.

8.7.6.2 When the cylinder or shell threads are damaged.

8.7.6.3 When there is corrosion that has caused pitting, including corrosion under removable nameplate assemblies.

8.7.6.4 When the extinguisher has been burned in a fire.

8.7.6.5 When a calcium chloride extinguishing agent has been used in a stainless-steel shell.

Table 1

Type of Extinguishers	**Test Interval (years)**
Soda acid (soldered brass shells) (until 1/1/82)	1
Soda acid (stainless steel shell)	5
Cartridge operated water and/or antifreeze	5
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (soldered brass shells) (until 1/1/82)	1
Foam (stainless steel shell)	5
Aqueous Film Forming foam (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon dioxide	5
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Dry chemical, cartridge or cylinder operated, with mild steel shells	12
Halen 1211	12
Halen 1301	12
Dry powder, cartridge or cylinder operated with mild steel shells	12

8.9 Training and education. Where portable fire extinguishers for employee use are provided in the workplace, Venue Management will also provide an educational program to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage firefighting.

8.8.1 Training intervals. Venue Management shall provide the education upon initial employment and at least annually thereafter.

8.8.2 Company specific training schedule.

*Site must decide on the specifics of fire extinguisher training required for your facility.

9. ASM Global FIRE PREVENTION POLICY.

9.1 Supervisors will ensure that the identity, address and phone number of the public fire department and other emergency units to be summoned in the event of a fire will be posted in strategic locations within their respective departments. See Venue Safety Committee for the appropriate information to be posted.

9.2 Supervisors will ensure that complex process alarm systems are tested on a (local code compliant) Basis to ensure the system is in working order. A written record of alarm tests shall be maintained.

9.3 A monthly self-inspection shall be conducted to identify and correct recognizable fire hazards.

9.4 Inspections of fire extinguishers and hose stations shall be conducted on a (local code compliant) basis to identify and correct recognizable fire hazards.

9.5 Exit doors, approved hardware, and lock devices, exit signs, passageways, and means of emergency exit shall be inspected on a (local code compliant) basis to ensure their working condition and unobstructed access. Padlocking of a designated fire exit door is prohibited.

9.6 Interior fire doors, which are part of the building design to limit the spread of fire, shall be inspected and tested on a (local code compliant) basis to insure their working condition. Holding fire doors open by use of chocks, door wedges, or similar means is prohibited.

9.7 Emergency lighting shall be inspected and tested on a (local code compliant) basis to assure good operating condition.

9.8 Respiratory protection equipment designated for emergency use shall be inspected monthly and the date recorded on a tag attached to the unit or storage container.

9.9 Sprinkler system control valves shall be wire “sealed” in the open position. All riser and valve locations shall be maintained free of storage and protected against damage by barrier or enclosures.

9.10 Safety and fire prevention requirements shall be followed in any required shutdown or impairment of automatic sprinkler protection systems.

9.11 Procedures for a fire permit system shall be established to control flame- or spark-producing equipment.

9.12 Procedures shall be established to control the receipt, storage, handling, and use of flammable liquids. The use of safety cans for handling separate storage of flammables, minimizing concentrations, and proper identification of containers are typical procedures, which shall be enforced.

9.13 Regulations shall be established to control smoking in hazardous areas. See (local code compliant) for specific guidelines on smoking.

9.14 Procedures shall be established for reporting and investigating fire and other incidents.

9.15 The training of selected personnel in the use of fire extinguishers shall be accomplished on a periodic schedule.

9.16 Procedures to accomplish after-hours notification of key personnel when the facility is operating at less than normal complement or shutdown shall be maintained and kept current.

9.17 Access of emergency vehicles shall be considered in regard to facilities' layouts. Parking of cars or other obstructions shall be restricted, as necessary.

9.18 Fire drills shall be carried out in accord with a regular yearly schedule.

9.19 Proposed changes in facilities' layouts, materials, operations, and constructions shall be reviewed by safety and fire prevention personnel as early in the planning stage as possible in order to establish the necessary fire prevention measures.

9.20 Safety and fire prevention personnel shall make sure that specialized training is provided to persons with responsibilities for maintenance of fire-fighting equipment, related systems, and supplies.

9.21 All personnel will:

9.21.1 Evacuate immediately when told to do so.

9.21.2 Take whatever immediate steps are necessary and feasible to minimize any hazard in leaving the work area unattended.

9.21.3 Not use elevators for evacuation purposes.

9.21.4 Assemble at a predetermined safe location for attendance check.

9.21.5 Not reenter building until the "all clear" signal sounds or similar verbal instructions are given by responsible authority.

9.22 Supervisors will:

9.22.1 Direct the evacuation of your area and account for personnel.

9.22.2 Advise the responding authority of the situation and warn of potentially hazardous conditions.

Note: It is not mandatory to maintain a fire brigade unless no other source of large-scale fire protection is available. However, if you decide to a have a brigade you must follow the guidelines established in 29 CFR 1910.156

10. Fire Brigade. (Not Applicable. TCF Center does not have a fire brigade.)

11. Locations/Types of Portable Fire Extinguishers.

LOCATIONS/TYPES OF PORTABLE FIRE EXTINGUISHERS

Location	Circle Type Extinguisher	Number	Last Annual Check	Remarks
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____

Class Fire Extinguishers. 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 Extinguishers. 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 Extinguishers. 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 Extinguishers. 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.

H - Indicates hoses system.

APPENDIX B – FIRE PREVENTION SAFETY POLICY STATEMENT

Our ASM Global fire prevention policy is designed to ensure that all reasonable steps are taken to preserve life and property from exposure to fire hazards. The requirements listed here identify the basic elements of our fire prevention program. They should be a part of every manager's day-to-day responsibilities. While they generally apply to all venue locations, they are especially important in those facilities that do not have full-time safety and fire prevention personnel.

Fire prevention is one of the considerations that must receive first priority in the design of a new building, or in the occupancy of an existing building. Safety and fire prevention specialists make a study of the building and the materials used in its construction. All necessary steps should be taken to ensure that fire prevention is an integral part of the design and construction of a new building or of an existing structure. The same scrutiny regarding potential fire hazards should be exercised in any future changes to the structure.

This policy is not intended to deal with the complexities of fire prevention in building design, fire protection systems, high-hazard exposures, compliance with legal ordinances, or the many technical details of fire prevention. It is meant to serve as an outline of the various aspects of our fire prevention program and as a helpful resource for managers and supervisors who must carry out the program's specific procedures.

GENERAL FIRE PREVENTION RULES

1. Identify the address and phone number of the public fire department and other emergency units, which may be summoned. Post this information and the emergency procedure for summoning assistance in the strategic locations.

2. Establish a warning system for fire or similar-type emergency. The alarm system shall be tested no less than weekly; with complex alarm systems being tested daily to ensure the system is in working order. A written record of alarm tests shall be maintained.

3. Each venue shall establish an emergency organization consisting of a select number of employees, organized, and trained, to deal effectively with fires, explosions, and similar occurrence.

4. A monthly self-inspection shall be conducted to identify and correct recognizable fire hazards.

5. Inspections of fire extinguishers and hose stations shall be conducted to identify and correct recognizable fire hazards.

6. Exit doors, approved hardware, and lock devices, exit signs, passageways, and means of emergency exit shall be inspected periodically to ensure their working condition and unobstructed access. Padlocking of a designated fire exit door is prohibited.

7. Interior fire doors, which are part of the building design to limit the spread of fire, shall be inspected and tested periodically to insure their working condition. Holding fire doors open by use of chocks, door wedges, or similar means is prohibited.

8. Emergency lighting shall be inspected and tested at periodic intervals to assure good operating condition.

9. Respiratory protection equipment designated for emergency use shall be inspected monthly and the date recorded on a tag attached to the unit or storage container.

10. Sprinkler system control valves shall be wire "sealed" in the open position. All riser and valve locations shall be maintained free of storage and protected against damage by barrier or enclosures.

11. Safety and fire prevention requirements shall be followed in any required shutdown or impairment of automatic sprinkler protection systems.

12. Procedures for a fire permit system shall be established to control flame- or spark-producing equipment.

13. Procedures shall be established to control the receipt, storage, handling, and use of flammable liquids. The use of safety cans for handling separate storage of flammables, minimizing concentrations, and proper identification of containers are typical procedures, which shall be enforced.

14. Regulations shall be established to control smoking in hazardous areas.

15. Procedures shall be established for reporting and investigating fire and other incidents.

16. The training of selected personnel in the use of fire extinguishers shall be accomplished on a periodic schedule.

17. Procedures to accomplish after-hours notification of key personnel when the facility is operating at less than normal complement or shutdown shall be maintained and kept current.

18. Access of emergency vehicles shall be considered in regard to facilities' layouts. Parking of cars or other obstructions shall be restricted, as necessary.

19. Fire drills shall be carried out in accord with a regular yearly schedule.

20. Proposed changes in facilities' layouts, materials, operations, and constructions shall be reviewed by safety and fire prevention personnel as early in the planning stage as possible in order to establish the necessary fire prevention measures.

21. Safety and fire prevention personnel shall make sure that specialized training is provided to persons with responsibilities for maintenance of fire-fighting equipment, related systems, and supplies.

SPRINKLER SYSTEM SHUTDOWNS

1. Planned impairment of automatic sprinkler systems shall be permitted only upon approval of the management responsible for the operations involved and shall be of the minimum possible durations.

2. Any person initiating or performing any action affecting sprinkler protection will determine that all of the following have been accomplished:

2.1 Venue maintenance supervision and the supervision of the area affected are notified in advance of the intended shutdown.

2.2 Fire protection procedures during shutdown have been reviewed and are satisfactory.

2.3 Equipment is on hand for emergency restoration of service.

2.4 All additional notifications of system shutdown are completed, including notice to the fire insurance company where applicable.

FIRE PERMIT REQUIREMENTS

1. A fire permit is required in operations involving flame- or spark-producing equipment when the degree of fire hazard is above normal due to the possible presence of flammable liquids, vapors, gases, combustible materials, and physical conditions of contraction.

2. Under no circumstances shall fire permits be authorized by anyone other than venue Security Personnel.

3. The person issuing fire permits will explain the requirements to the personnel involved, including any outside contractor, at the time the permit is issued and before the work is started.

4. Departments shall duplicate and use the fire permit form included in this standard or one of similar design, which equals or exceeds the intent.

5. Cutting or welding will not be done while sprinklers are out of service. Any exceptions must be approved by venue management and safety and fire prevention personnel.

6. The fire permit must be visible at the work site.

7. Additional fire protection equipment such as extinguishers will be provided. A fire watch may be provided, as necessary.

8. Floors and surrounding areas should be swept clean and may be wetted down as necessary.

9. A fire permit does not authorize smoking privileges in any area.

FIRE DRILLS AND EMERGENCY EVACUATION PROCEDURES

It is the responsibility of every manager and department head in the venue to ensure that the employees under their supervision know how to get out of the building in the event of a fire emergency. An orderly evacuation depends on both an early warning and employee awareness of the proper procedures to follow. While the procedures below apply to all venue facilities managers in small locations with few employees must use their own judgment in implementing them.

1. Each venue shall establish procedures to be followed regarding the evacuation of buildings in emergencies.

2. Where possible, key emergency instructions shall also be highlighted in the venue phone directory.

3. Each venue shall have an alarm system or other suitable means to alert the occupants to the need for evacuation.

4. Concise emergency instructions shall be posted at strategic locations throughout the premises, including a floor plan drawn to indicate the emergency exits, the procedure for sounding an alarm, and evacuation instructions.

5. Fire drills shall be held in accordance with a regular schedule. In general, all venues should have not less than one fire drill annually.

6. Emergency exits and routes leading to them shall be clearly identified by signs. Current standards on construction, dimensions, lighting, and number of exits required by safety codes shall apply in designating exits.

7. As applicable, location procedures should include the following minimum personnel actions after the alarm has sounded:

<u>All Personnel</u>

Take whatever immediate steps are necessary and feasible to minimize any hazard in leaving the work area unattended.

Do not use elevators for evacuation purposes.

Assemble at a predetermined safe location for attendance check.

Do not reenter building until the "all clear" signal sounds or similar verbal instructions are given by responsible authority.

<u>Supervisors</u>

Direct the evacuation of your area and account for personnel. Advise the responding authority of the situation and warn of potentially hazardous conditions.

FIRE EXTINGUISHERS

Fire extinguishers are classified on the basis of what types of fires they are most effective in handling:

CLASS A extinguishers should be used for fires involving ordinary combustible materials such as paper, wood, and textiles.

CLASS B extinguishers should be used for fires in flammable materials such as gasoline, oils, lacquer, thinner, paints, and greases.

CLASS C extinguishers should be used for fires in electrical equipment. CLASS D extinguishers should be used for fires involving metals.

Fire extinguishers are provided for use within specific areas and are considered "first aid" to control fire in the early stages.

FIRE ALARM SYSTEMS

1. Fire alarm systems are used to warn employees of emergency conditions and to trigger an orderly evacuation of the building. Such systems also provide the means to activate fire control equipment and notify the fire department and other emergency services. Statutory regulations, fire codes, and other local building codes normally specify the requirements for alarm system installations.

2. Fire alarm systems can be either manual or manual-automatic in operation. Manual systems must be activated by persons at the location. Manual-automatic systems detect a predetermined condition and activate the alarm system automatically, in addition to being manually operated by personnel at the location.

TERMINOLOGY

LOCAL SYSTEM: Sounds an alarm on the premises only.

AUXILIARY SYSTEM: Sounds a local alarm and is connected to a municipal fire department or other emergency organization location.

CENTRAL STATION SYSTEM: Sounds a local alarm and is connected to a constantly manned location off the company property. Signals transmitted to the central station result in specified actions.

SUPERVISORY SYSTEM: Signal only systems, which are installed to monitor temperatures, water pressure, water flow, controls, instruments, fire equipment, flame failure, overexposure, and similarly selected events. Depending on conditions, supervisory systems are independent installations or can be incorporated as part of the fire alarm system.

CLOSED CIRCUIT CODED SYSTEM: Provides alarm on activation in selected areas, such as emergency headquarters and the identified fire location by signal code.

MULTIPLEX SYSTEMS: Modern electronic alarm systems using radio transmission or combinations of wire, cable, and radio to receive and communicate simultaneous and/or multiple signals.

DETECTION DEVICES: Devices incorporated in alarm systems, which act in response to selected stimuli and, in turn, activate the alarm system. These include such devices as smoke detectors, heat detectors, thermostats, photoelectric ionization detectors, and similar devices.

CODED ALARM SIGNAL: Audio or visual/audio signals, which by assignment indicate the section of the alarm system activated.

FIRE ALARM SYSTEM REGULATIONS

1. Each location shall have a system to warn building occupants in the event of fire or emergency so as to give them ample warning notice and enough time for escape in an orderly manner.

2. Safety and fire prevention personnel shall provide counsel on installation of fire alarm systems in accord with the occupancy, size use exposures, company experience, statutory regulations and the need to avoid undue danger to the lives and safety of the occupants from fire, smoke, fumes, or other possible emergency situations.

3. Alarm system signals shall be selected in accord with the ambient noise conditions existing in the location and located so as to be distinctively audible to all personnel under normal operating conditions.

4. Control panels for alarm system installations, which indicate the location of detectors, circuits, or otherwise identify the area of the emergency, should be located in the most likely avenues of approach by fire fighters or emergency personnel, and be readily accessible.

5. All systems shall have one primary and one secondary source of power. The second source shall have the capacity to operate maximum normal loads in accordance with recognized installation standards.

First Aid/CPR/AED

PURPOSE

This program sets down policy for employees working at TCF Center concerning their responsibility to administer and receive first-aid, CPR and AED assistance.

First aid is emergency care provided for injury or sudden illness before emergency medical treatment is available. The first-aid provider in the workplace is someone who is trained in the delivery
of initial medical emergency procedures, using a limited amount of equipment to perform a primary assessment and intervention while awaiting arrival of emergency medical service (EMS) personnel.

RESPONSIBILITY

The Manager of Security and Public Safety is responsible for the first aid/CPR/AED program. This includes making first aid supplies available and ensuring AEDs are in place and ready to go.

The Director of Human Resources is responsible for the interface and compliance with OSHA's Blood Borne Pathogen standard, employee training, making requisite PPE available and ensuring that HBV vaccines and medical follow-up are offered as required following an exposure incident.

BLOODBORNE PATHOGENS

As has been ASM Global policy with CPR and AED trained personnel, anyone having potential exposure to blood or OPIM shall be given training, medical follow-up and PPE as required by OSHA's blood borne pathogen standard commensurate with the limited potential exposure when providing basic first aid.

TCF CENTER APPROACH

ASM Global management at TCF Center knows that the best way to prepare for workplace accident is to focus on prevention through the implementation of a comprehensive worker safety and health program that emphasizes training, information, and accountability. However, it is reasonable to expect that, despite our best efforts, there may occasionally be a need for properly trained first aiders, CPR and AED trained personnel. The availability of AEDs for the public and ASM Global employees demonstrates ASM Global's commitment to a safe work and public environment at TCF Center.

IMPORTANT BACKGROUND INFORMATION

The OSHA standard that addresses first aid medical assistance for TCF Center is 1910.151. It also addresses the need for emergency flushing facilities when employees are handling corrosive chemicals.

Paragraph 1910.151(b) of OSHA's general industry standard on medical services and first aid states, "In the absence of an infirmary, clinic, or hospital in near proximity 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. Adequate first aid supplies shall be readily available."

OSHA stated in a letter of interpretations that, "The primary requirement addressed by these first aid standards is that an employer must ensure prompt first aid treatment for injured employees, either by providing for the availability of a trained first aid provider at the worksite, **or** by ensuring that emergency treatment services are within reasonable proximity of the worksite."

The employer must ensure that ". . . adequate first aid is available in the critical minutes between the occurrence of an injury and the availability of physician or hospital care for the injured employee."

The letter further explains: "While the first standards do not prescribe a number of minutes, OSHA has long interpreted the term 'near proximity' to mean that emergency care must be available within no more than 3-4 minutes from the workplace. Medical literature establishes that, for serious injuries such as those involving stopped breathing, cardiac arrest, or uncontrolled bleeding, first aid treatment must be provided within the first

few minutes to avoid permanent medical impairment or death. Accordingly, in workplaces where serious accidents such as those involving falls, suffocation, electrocution, or amputation are possible, emergency medical services must be available within 3-4 minutes, if there is no employee on the site who is trained to render first aid."

In the past, OSHA has exercised discretion in enforcing the first aid requirements in particular cases. For example, OSHA recognizes that in workplaces, such as offices, where the possibility of such serious work-related injuries is less likely, a longer response time of up to 15 minutes may be reasonable.

29 CFR 1910.151(b) does not specifically address the placement of first aid kits and/or cabinets based on employee numbers, density, or geography. Therefore, it is the employer's responsibility to assess the particular needs of the workplace and tailor first aid kits and their placement to the specific needs of the workplace. OSHA compliance officers take into consideration a variety of factors when assessing compliance with 29 CFR 1910.151(b). OSHA cannot provide a list of “exact requirements” which will apply for every workplace; each workplace must be evaluated on a case-by-case basis, taking into account the types of injuries and illnesses that are likely to occur at that workplace”

THE OSHA REQUIREMENT FOR CPR

1910.146 OSHA’s Permit-Required Confined Space standard requires that whenever entries are made and a hazardous atmosphere is possible, rescue personnel who are required to enter the confined space be trained in first aid and CPR. TCF Center will ensure its compliance with this requirement when hiring contractors for its ejection pit confined space entry cleaning.

In other situations, although not specified by OSHA, the term “proper first aid” in 1910.151 implies that CPR may be needed to comply with its provisions. ASM Global has decided that such training is beneficial and ASM Global wants to exceed its obligation under OSHA law and has trained personnel in CPR with the understanding that there is no requirement for them to assist in an emergency if they feel in any way that their own safety would be compromised.

FIRST AID SUPPLIES

The Manager of Security and Public Safety will decide and obtain the types and amounts of first-aid supplies and arrange to maintain an adequate supply of these supplies. The supplies must be adequate, should reflect the kinds of injuries that occur, and must be stored in an area where they are readily available for emergency access.

AUTOMATED EXTERNAL DEFIBRILLATOR (AED)

Sudden cardiac arrest (SCA) may occur at work. According to recent statistics from the American Heart Association, there are 250,000 out-of-hospital SCAs annually. The actual numbers of SCAs that happen at work are unknown. If an employee collapses without warning and is not attended to promptly and effectively, the employee may die. Sudden cardiac arrest is caused by abnormal, uncoordinated beating of the heart or loss of the heartbeat altogether, usually as a result of a heart attack.

The safety director must obtain estimates of EMS response times for all times of the day and night at which they have workers on duty, and should use that information when planning their first aid

program. When developing a workplace first-aid program, consultation with the local fire and rescue service or emergency medical professionals may be helpful for response time information and other program issues. Because it can be a workplace event, SCA should be considered by employers when planning a first-aid program.

First-Aid Program policies and procedures should be communicated to all employees, including those workers who may not read or speak English. Language barriers should be addressed both in instructing employees on first-aid policies and procedures and when designating individuals who will receive first-aid training and become the on-site first-aid providers.

An AED is a device that automatically analyzes the heart rhythm of someone in SCA. It is used to "reset" the electrical activity of a victim's heart during SCA. Delivering a pre-programmed shock to the victim through use of friendly, self-adhesive electrodes, the hearts effective beating pattern is restored.
AEDs are safe, easy, and effective. Implementing a shock is as easy as one button and can be safely used by persons who have received proper AED and CPR training and who have been certified to use an AED by a competent authority.

As of **January 2012,** there were a total of fifty-six state bills pending or recently passed which specifically relate to Defibrillators (AEDs) and Cardiac Arrest nationwide. The Safety Director will periodically check with the local EMS responders to get updates on new requirements for the State of Michigan.

With recent advances in technology, automated external defibrillators (AEDs) are now widely available, safe, effective, portable, and easy to use. They provide the critical and necessary treatment for sudden cardiac arrest (SCA) caused by ventricular fibrillation, the uncoordinated beating of the heart leading to collapse and death. Using AEDs as soon as possible after sudden cardiac arrest, within 3-4 minutes can lead to a 60% survival rate. CPR is of value because it supports the circulation and ventilation of the victim until an electric shock delivered by an AED can restore the fibrillating heart to normal.

All worksites are potential candidates for AED programs because of the possibility of SCA and the need for timely defibrillation. Each workplace should assess its own requirements for an AED program as part of its first-aid response. A number of issues should be considered in setting up a worksite AED program: physician oversight; compliance with local, state, and federal regulations; coordination with local EMS; a quality assurance program; and a periodic review, among others.

Training will be conducted every two (2) years by instructors certified thru the American Heart Association, the American Red Cross, or National Safety Council with a 4-hour minimum course of instruction. Instructions will include skills review, practice, and testing. Training records will be maintained by the Safety Director

Those workers trained in CPR were also trained on the use of AEDs. Following the "Good Samaritan" precepts, ASM Global does not expect employees to perform CPR or use an AED unless they feel that fully confident and secure in their ability and their own safety.

LOCATION AND MAINTENANACE OF AED'S

There are six (6) AED Units located in TCF Center.

- 1st floor outside hall E2 across from the Atwater 2 entrance
- 2nd Floor on the column adjacent to the Main Information Desk and the Detroit Shoppe and near the stairs outside room 260
- 3rd Floor on the column opposite Meeting Room 331A and the stairs outside room 360
- 4th Floor on the column near stairwell B

MAINTENANCE

The AED and supplies will be tested and inventoried in accordance with the manufacturers' recommendations, once monthly by the Security Supervisor.

FIRST AID STATIONS

Current locations are security office, engineering shop, control room, administration office, information booth, Congress loading dock security station, MI loading dock security station and parking office. These stations are outfitted with standard first aid supplies.

FIRST AID TRAINING

Training for first aid is offered by the American Heart Association, the American Red Cross, the National Safety Council, and other nationally recognized and private educational organizations. OSHA does not teach first-aid courses or certify first-aid training courses for instructors or trainees.

First-aid courses should be individualized to the needs of the workplace. Some of the noted program elements may be optional for a particular plant or facility. On the other hand, unique conditions at a specific worksite may necessitate the addition of customized elements to a first-aid training program. NOT all of the training below is necessary all of the time or for all employees. The Director of Human Resources will use his/her best judgment using past experience and advice from local responders. Currently, ASM Global will identify designated management personnel and security personnel to be trained in basic first aid and the first aid supplies purchased by ASM Global will be commensurate with that level of training.

It is noteworthy that special construction projects or other non-routine tasks involving hazardous work may require special training of certain designate personnel

ELEMENTS OF A FIRST AID PROGRAM

There are a number of elements to include when planning a first aid training program for a particular workplace. These recommendations are based on the best practices and evidence available at
the time this policy was written and are not inclusive of all required metrics – nor does the absence of a subject mean it is not necessary.

Program elements ***to be considered*** are:

Teaching Methods

Training programs should incorporate the following principles:

- Basing the curriculum on a consensus of scientific evidence where available.
- Having trainees develop "hands-on" skills through the use of mannequins and partner practice.
- Having appropriate first-aid supplies and equipment available.
- Exposing trainees to acute injury and illness settings as well as to the appropriate response through the use of visual aids.
- Including a course information resource for reference both during and after training.
- Allowing enough time for emphasis on commonly occurring situations.
- Emphasizing skills training and confidence-building over classroom lectures.
- Emphasizing quick response to first-aid situations.

Preparing to Respond to a Health Emergency

The training program should include instruction or discussion in the following:

- Prevention as a strategy in reducing fatalities, illnesses, and injuries.
- Interacting with the local EMS system.
- Maintaining a current list of emergency telephone numbers (police, fire, ambulance, poison control) accessible by all employees.
- Understanding the legal aspects of providing first-aid care, including Good Samaritan legislation, consent, abandonment, negligence, assault and battery, State laws and regulations.
- Understanding the effects of stress, fear of infection, panic; how they interfere with performance; and what to do to overcome these barriers to action.
- Learning the importance of universal precautions and body substance isolation to provide protection from bloodborne pathogens and other potentially infectious materials.
- Learning about personal protective equipment -- gloves, eye protection, masks, and respiratory barrier devices. Appropriate management and disposal of blood-contaminated sharps and surfaces; and awareness of OSHA's Bloodborne Pathogens standard.

Assessing the Scene and the Victim(s)

The training program should include instruction in the following:

- Assessing the scene for safety, number of injured, and nature of the event.
- Assessing the toxic potential of the environment and the need for respiratory protection.
- Assessing each victim for responsiveness, airway patency (blockage), breathing and medical alert tags.
- Taking a victim's history at the scene, including determining the mechanism of injury.
- Stressing the need to continuously monitor the victim.
- Emphasizing early activation of EMS.
- Repositioning ill/injured victims to prevent further injury.
- Performing a logical head-to-toe check for injuries.
- Indications for and methods of safely moving and rescuing victims.
- Repositioning ill/injured victims to prevent further injury.

Responding to Life-Threatening Emergencies

The training program should be designed or adapted for the specific worksite and may include first-aid instruction in the following:

- Establishing responsiveness.
- Establishing and maintaining an open and clear airway.
- Performing rescue breathing.
- Treating airway obstruction in a conscious victim.
- Performing CPR.
- Using an AED.
- Recognizing the signs and symptoms of shock and providing first aid for shock due to illness or injury.
- Assessing and treating a victim who has an unexplained change in level of consciousness or sudden illness.
- Controlling bleeding with direct pressure.

Poisoning

- Ingested poisons: alkali, acid, and systemic poisons. Role of the Poison Control Center (1-800-222-1222).
- Inhaled poisons: carbon monoxide; hydrogen sulfide; smoke; and other chemical fumes, vapors, and gases.
- Knowledge of the chemicals at the worksite and of first aid and treatment for inhalation or ingestion.
- Immediate access to and knowledge of the location of MSDS on site

First-aid responders may have long intervals between learning and using CPR and AED skills. Numerous studies have shown a retention rate of 6-12 months of these critical skills. The American Heart Association's Emergency Cardiovascular Care Committee encourages skills review and practice sessions at least once annually for CPR and AED skills.

Instructor-led retraining for life threatening emergencies should occur at least every two (2) years. Retraining for non-life-threatening response should occur periodically.

The first-aid program and the level of trained staff will be reviewed periodically (once a year at minimum) to determine if it continues to address the needs of the specific workplace. Training, supplies, equipment, and first-aid policies should be added or modified to account for changes in workplace safety and health hazards, worksite locations and worker schedules since the last program review. The first-aid training program should be kept up-to date with current first-aid techniques and knowledge. Outdated training and reference materials should be replaced or removed.

Hazardous Chemical Communication Program

A. Company Policy

TCF Center and ASM Global are committed to the prevention of exposures that result in injury and/or illness; and to comply with all applicable state health and safety rules. To make sure that all affected employees know about information concerning the dangers of all hazardous chemicals used by TCF Center the following hazardous information program has been established.
All departments of TCF Center will participate in the hazard communication program. This written program will be available in the Safety Plan Binder located in the Engineering and Housekeeping department for review by any interested employee.

B. Container Labeling

All chemicals are purchased in labeled containers. No chemicals should require labeling. Before relabeling any chemicals, contact your department head for instructions on how to proceed.

C. Material Safety Data Sheets (MSDS)

The Engineering and Housekeeping department is responsible to establish and monitor the MSDS sheets for the building. A copy of each MSDS sheet needs to be provided to the Engineering Manager and Housekeeping Operations Manager to be placed in the binder in their respective office. In addition, a binder of MSDS sheets used in that department needs to be available to employees at their request and review. The Engineering Manager and Housekeeping Operations Manager will be responsible for ensuring the above is being followed. This person will also make sure procedures are developed to obtain the necessary MSDSs and will review incoming MSDSs for new or significant health and safety information. This person will ensure each department provides any new information on to affected employees.
The Engineering Manager and Housekeeping Operations Manager or Department Head will review incoming MSDSs for new or significant health and safety information. Any pertinent information will be passed on to affect employees immediately after review. Toxicity information in all new chemicals will be reviewed to determine if current procedures will provide the necessary protection MSDSs will be available to all employees during each work shift. If an MSDS is not available or a new chemical in use does not have an MSDS, immediately contact the appropriate supervisor and/or manager.

D. Employee Information and Training

The Engineering Manager and Housekeeping Operations Manager will make sure that before starting work, each new employee will attend a brief health and safety orientation that includes information and training on the following:

- How to report an injury/illness/near miss or safety concerns.
- Location of the MSDS file and written hazard communication program along with other safety programs.
- An overview of the requirements contained in the Hazard Communication Standard.

An in-depth safety training with be provided annually to each new employee. At this training, the following will be presented:

- Hazardous chemicals present at his or her workplaces.
- Physical and health risks of the hazardous chemical.
- The symptoms of overexposure.
- How to determine the presence or release of hazardous chemicals in his or her work area.
- How to reduce or prevent exposure to hazardous chemicals through use of control procedures, work practices, and personal protective equipment.
- Steps the employer has taken to reduce or prevent exposure to hazardous chemicals.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- How to read labels and review MSDSs to obtain hazard information.
- Standard Operating Procedures for each job task and on the job training.

Before introducing a new chemical hazard into any section of this employment, each employee in that section will be given information and training as outlined above for the new chemical.

E. Multi-employer workplaces

It is the responsibility of the Engineering Manager and Housekeeping Operations Manager to provide employers of any other employees at the work site with the following information:

- Copies of MSDSs (or make them available at a central location) for any hazardous chemicals that the other employer(s)' employee may be exposed to while working.
- Inform other employers of any precautionary measures that need to be taken to protect employees during normal operating conditions or in foreseeable emergencies.
- Provide other employers with an explanation of the labeling system that is used at the work site.

It is also the responsibility of the Engineering Manager to identify and obtain MSDSs for the chemicals the contractor is bringing into the workplace.

List of Hazardous Chemicals

The following is a list of hazardous chemicals used by our employees. Further information on each chemical can be obtained by reviewing the MSDSs located in the Engineering and Housekeeping department.

	Manufacturer	Product Name / Label	Work / Storage Area	Description
1	Westinghouse	Lamp 40 Twist / 41	Catwalks	Compact Fluorescent Lamps
2	Research Products	RP Super Filter Coat		Adhesive
3	Exxon Mobile	Mobile Delvac Synth. Gear Oil	Chiller Room Strainer	Lubricant
4	Exxon Mobile	Mobile Grease XHP	Mechanical Rooms	Lubricant
5	Tire Seal Inc.	Supercool	Vacuum Pumps	Lubricant
6	RPM Company	Alex Plus	Multiple Location	Silicone Caulk
7	Milwaukee Electric Tool	Lithium ION Battery	Portable Hand Tool	Battery
8	GES	Advance Materials	Multiple Location	Silicone Sealant
9	Hartline Products Inc.	Rockite Cement	Multiple Location	Concrete Patching
10	Global Ecotech	Endura Flex	Concrete Cracks	Crack Filler
11	Great Lakes Assoc.	TruFlo 400 Series	Closed Water Treatment	Water Treatment
12	Henkel Corp.	N1000 High Purity Anti Sieze	Pipe Flange Bolts	Bolt Treatment
13	Wenling Zeguo Dali	Capacitor 5 MFD	Equipment	Run Capacitor
14	Ridge Tool Co	Rigid Nu Clear Thread Cutting Oil	Threading Machine	Threading Oil
15	Sakura Color Prod.	Solid Marker	Office	Marking Crayon
16	Irwin	Irwin Chalk	Multiple Location	Snap Line Caulk
17	Survivair	Willson N9510F	Multiple Location	Respirator
18	Zurn Industries	Zurn Neo Seal Gasket Cement	Plumbing Drains	Gasket Cement
19	ITW Ramset	Metal Fasteners	Multiple Location	Anchor Pin Drop In
20	Cardinal Health	Instant Cold Pack	First Aid Kit	Cold Pack for Treatment
21	National Refrigerants	R-134-A	Chiller Room & Lines	Tetrafuoroethane Chiller Line Ad
22	Nu Calgon Wholesaler	Nu-Brite	MEP Storage Area	Corrosive Liquid
23	Foremost	Grill Brite	MEP Storage Area	Grill Cleaner
24	Rust Oleum	641 Thinner	MEP Storage Area	Petroleum Spirits
25	Speed Clean	Speedy Clean	MEP Storage Area	Concrete Dissolver
26	Armacell Australia	Armaflex 520 Adhesive	MEP Storage Area	Adhesive
27	IPS Corporation	Weld on P68	MEP Storage Area	Primer
28	Ridge Tool Co	Cable Rust Inhibitor	MEP Storage Area	Rust Inhibitor
29	Hercules Chemical Co	Stay Put Ultra	MEP Storage Area	Plumbers Putty
30	JC Whitlam Manuf.	No Seize Anti Sieze	MEP Storage Area	Lubricant & Thread Sealant
31	Jomar International	Jomar Tef Seal	MEP Storage Area	Pipe Joint Sealant
32	MAPP Gas	Airgas, Inc	Crib 29	
33	Sherwin Williams	K4 Mineral Spirits	Crib 29	Mineral Spirits Reducer
34	Chemtrec	Battery Coat	Crib 29	Battery Terminal Protector
35	Sopus Products	Snap Belt Dressing	Crib 29	Solvent
36	Bostik, Inc.	Never Seez Grade Compound	Crib 29	
37	WM Garr	Odorless Mineral Spirits	Crib 29	Mineral Spirits
38	Jasco Chemical	Paint & Epoxy Remover	Crib 29	Paint Cleaning Agent
39	Akzo Nobel Coatings	Penetrol	Crib 29	Paint Oil Additive
40	WD-40	WD - 40 Aerosol	Crib 29	Lubricant
41	Roman Decorating Products	Golden Harvest Wallpaper Paste	Crib 29	Wallpaper Paste
42	Dynatron/Bondo Co.	Bondo UV Body Filler	Crib 29	Body Filler
43	United States Gypsum	Sheetrock Joint Compound	Crib 29	Drywall Joint Compound
44	Mapei Corp.	Ultra-Bond ECO	Crib 29	Acrylic Cove Base Adhesive
45	DAP Inc	Acrylic Latex Caulk	Crib 29	Acrylic Latex Caulk Compound
46	DAP Inc	Painters Caulk	Crib 29	Caulk

47	Minwax Co.	Wood finish Series (multiple colors)	Crib 29	Wood finish
48	Minwax Co.	Wood Polyurethane Clear All	Crib 29	Wood Clear Coat
49	WW. Henry Co.	Henry 237 AcoustiGum	Crib 29	Latex Ceiling Adhesive
50	WW. Henry Co.	Henry 356 C Carpet & Tile Adhesive	Crib 29	Floor Adhesive
51	WW. Henry Co.	Henry 440 Cove Base Adhesive	Crib 29	Base Adhesive
52	3M	3M Fastbond Contact Adhesive	Crib 29	Contact Adhesive
53	Sherwin Williams	Latex Satin A97-1200	Inv. Control	Paint
54	Sherwin Williams	Latex Semi-Gloss B31W-2200	Inv. Control	Paint
55	Sherwin Williams	Latxe Flat B30-8200	Inv. Control	Paint
56	Sherwin Williams	Latex Eggshell B20w2200	Inv. Control	Paint
57	Sherwin Williams	Latex B20-2600	Inv. Control	Paint
58	Sherwin Williams	Latex B30-2600	Inv. Control	Paint
59	Sherwin Williams	Oil B54W-0101	Inv. Control	Paint
60	Sherwin Williams	Alkyd Semi-gloss B34W-00251	Inv. Control	Paint
61	Old Masters	Finishing Stain multiple colors	Inv. Control	paint
62	USG	Taping Joint Compound	Inv. Control	Joint Compound
63	National Chemicals Inc.	TSP	Inv. Control	Anhydrous Cleaner
64	Ardex	Feather Finish	Inv. Control	Finishing Cement Compound
65	HB Fuller	Accu Color Sanded	Inv. Control	Grout
66	USG	Durabond 20	Inv. Control	Setting Joint Compound
67	Chevron Texaco	Starplex Moly	Inv. Control	Grease
68	Quikcrete	Crack Seal	Inv. Control	Acrylic crack filler
69	Akzo Noble Coatings	Penetrol	Inv. Control	Paint additive
70	Golden Harvest	Universal border paste	Inv. Control	Wallpaper paste
71	Minwax Co.	Wood finish Series (multiple colors)	Inv. Control	Stain
72	Minwax Co.	Fast Dry Polyurethane	Inv. Control	poly urethane
73	Henry	Acoustic Gum	Inv. Control	Ceiling tile anhesive
74	Henry	356C Multipro	Inv. Control	Carpet Adhesive
75	Henry	440 cove base adhesives	Inv. Control	Adhesive
76	DAP Inc	Alex acrylic painters caulk	Inv. Control	Caulk
77	WD-40	WD-40	Inv. Control	Penetrant/lubricant
78	Mapei Corp.	Ultrabond ECO810	Inv. Control	Adhesive
79	Mapei Corp.	Planiprep	Inv. Control	skimcoat
80	Mapei Corp.	Ultrabond ECO 575	Inv. Control	Adhesive
81	Flame Control Coatings	FC no. 3003	Inv. Control	Primer
82	USG	Epoxy	Inv. Control	Paint
83	NAPA	comm. Coating 6032	Inv. Control	paint
84	Quikcrete	Mortar Mix	Inv. Control	Mortar
85	CS Group	Mastic	Inv. Control	Adhesive
86	Custom Building Products	Polyblend	Inv. Control	Grout
87	Tile Bond	Acoustic sound Sealent	Inv. Control	Paint
88	Shaw	500 adhesives	Inv. Control	Carpet Adhesive

89	Shurstick	Cove Base Adhesive	Inv. Control	Adhesive
90	DAP Inc	Construction Adhesive	Inv. Control	Adhesive
91	Color Rite	Sealent and Adhesive	Inv. Control	Adhesive
92	Loctite	Powergrab construction adhesive	Inv. Control	Adhesive
93	Loctite	PL375 Heavy Duty adhesive	Inv. Control	Adhesive
94	Seymoure	MRO	Inv. Control	Paint
95	Klean Strip	XYLOL	Inv. Control	Cleaner
96	Prozone	Belt Dressing	Inv. Control	Lubricant
97	Zep	Battery Cleaner	Inv. Control	Cleaner
98	Jet Coat	Roof Patch	Inv. Control	Tar sealent
99	Liquid Nails	Liquid Nails Construction Adhesive	Inv. Control	Adhesive
100	GE	Silicone	Inv. Control	Caulk
101	Roberts	Cove base adhesive	Inv. Control	Adhesive
102	United Paint and Chemical	F6	Inv. Control	Paint
103	Roman Decorating Products	Pro 543	Inv. Control	Border adhesive
104	Bondo	Body Filler	Inv. Control	Metal Filler
105	Dupont	Teflon	Inv. Control	Lubricant
106	Dow	Great Stuff	Inv. Control	Space filler/Insulant
107	Milwaukee Electric Tool	Rotor Hammer Lube	Inv. Control	Lubricant
108	Tile Bond	Wood Glue	Inv. Control	Adhesive
109	Ace	Spray Primer	Inv. Control	Paint
110	Rust Oleum	Auto enamel	Inv. Control	Paint
111	Bostik, Inc.	Neversee	Inv. Control	Lube/Primer
112	Homax	Acoustic Popcorn	Inv. Control	Texture Paint
113	Diversey	Stride	Inv. Control	Cleaner
114	Blakely Products	400 Tile Adhesive	Inv. Control	Adhesive
115	Ecolab	Bathroom Disinfectant	Inv. Control	Cleaner
116	Spartan	Clean by Peroxy #15	Housekeeping	Cleaning Agent
117	Spartan	Xcelente #24	Housekeeping	Cleaning Agent
118	Spartan	NABC Concentrate #1	Housekeeping	Disinfectant
119	Spartan	Tough Duty	Housekeeping	Cleaning Agent
120	Spartan	Stainless Steel Cleaner	Housekeeping	Cleaning Agent
121	The Clorox Company	Bleach Germicidal Wipes	Housekeeping	Disinfectant
122	GOJO Industries	Green Certified Foam Hand Cleaner	Housekeeping	Skin Care
123	Spartan	Airlift Clothesline Fresh Clean	Housekeeping	Air Freshener
124	Kutol Products Company	Foaming Luxury Hand Soap	Housekeeping	Hand Soap
125	Kutol Products Company	Pink Lotion Soap (Transplant)	Housekeeping	Hand Soap
126	Arrow Chemical Products	Yellow Cement Floor Cleaner	Housekeeping	Concrete Cleaner
127	Spartan	SC-200	Housekeeping	Cleaning Agent
128	Spartan	SPARCREME	Housekeeping	Cleaning Agent
129	Spartan	Biorenewables Glass Cleaner	Housekeeping	Cleaning Agent
130	Sunflower Vegetable Oil	Vinegar, All Varieties	Housekeeping	

Hearing Loss Prevention Program

A successful hearing loss prevention program benefits both TCF Center and affected employees. Employees are spared disabling hearing impairments, and evidence suggests that they may experience less fatigue and generally better health. Ultimately, the company benefits from reduced medical expenses and worker compensation insurance. In some cases, there may be improved morale and work efficiency.

TCF Center will comply with the occupational health noise rules by emphasizing prevention of hearing loss for employees. This reflects a belief that hearing loss is avoidable. This document presents the seven important elements of TCF Centers successful hearing loss prevention program:

1. Noise exposure monitoring
2. Noise control process
3. Hearing protection
4. Education and notification
5. Audiometric evaluation
6. Record keeping
7. Program evaluation

A Hearing Conservation Program is a part of a HLPP and includes program elements 1 through 6. A Hearing Conservation Program is required for TCF Center in the event that employees become exposed to excessive noise levels. Excessive noise levels are as defined in the MIOSHA Part 380 *Occupational Noise Exposure* standard as an attachment to this program.

1. Noise Exposure Monitoring

Conducting building specific noise evaluations, TCF Center identifies work environments which may provide exposure to potential harmful levels. Through monitoring with a handheld sound level meter, date, time, and decibel results are recorded. Should environmentally noise levels be determined to be excessive as defined in the MIOSHA Part 380 *Occupational Noise Exposure 6/16/1993* standard, the proper hearing protection / conservation steps are to be followed.

Exposure monitoring will be repeated at least every two years, or whenever there is a change in equipment, production processes or maintenance routines. It may be necessary to assess noise exposure when work practices and/or shift durations change or when workers develop Standard Threshold Shifts

Noise exposure monitoring is conducted for various purposes:

1. Determining whether hazards to hearing exist
2. Determining whether noise presents a safety hazard by interfering with speech communication or recognition of audible warning signals
3. Identifying employees for inclusion in the hearing conservation program
4. Making priorities for noise control efforts and establishing hearing protection practices
5. Identifying specific noise sources for the implementation of engineering controls

6. Evaluating the success of noise control efforts

Noise Exposure Monitoring Results- The following table describes the requirements of the hearing conservation program with recommendations for an effective HLPP.

If a worker's noise exposure…	Then… (Action by TCF Center)
…is below the "action level"	**Nothing. Recommend use of hearing protection when exposure is greater than 80 dBA TWA.**
…equals or exceeds the "action level" (85 dBA TWA), but does not exceed the "PNE" (90 dBA TWA) ****MANDATORY****	• **Enroll the worker in a hearing conservation program including exposure monitoring** • **Provide hearing protectors** • **Ensure that the hearing protectors are worn if the worker has a standard threshold shift or it will be longer than 6 months before receiving a baseline audiogram.**

… equals or exceeds the "PNE" (90 dBA TWA) ****MANDATORY****	• **Hearing protection required** • **Hearing conservation program required** • **Feasible engineering and administrative controls must be implemented when PNE is exceeded**
… exceeds a TWA of 105 dBA (the "dual hearing protection level") ****ADVISORY****	• **Same as exceeds the "PNE," plus provide the worker with both earplug and earmuff type hearing protectors and ensure they are worn concurrently**
… exceeds 115 dBA ****ADVISORY****	• **No workers, including those with dual hearing protectors, are permitted to be exposed to sound levels exceeding 115 dBA**

The "action level" is triggered when employee exposure exceeds 85 dBA TWA. The permissible Noise Exposure Limit or "PNE" is 90 dBA TWA.

2. Noise Control Process

MIOSHA standards emphasize elimination of hazards by requiring TCF Center to implement feasible engineering controls. Engineering controls are defined as any modification or replacement of equipment or related physical change at the noise source or along the transmission path (with the exception of hearing protectors) that reduces the noise level. Noise exposures can be lowered or eliminated by identifying existing feasible controls; planning to purchase quiet, new, and rebuilt equipment; and considering noise control as part of a preventative maintenance program. The three elements of a successful noise control process are summarized as *Buy-It-Quiet, Make-It-Quiet and Keep-It-Quiet*.

Buy-It-Quiet: TCF Center works to reduce noise producing equipment through the purchasing process. Several actions to obtain reduced noise equipment can be used:

- Request that supplier quotations address noise controls separately, with detailed descriptions and costs.
- Review and approve proposed controls with appropriate personnel prior to the purchase
- Obtain manufacturer documentation of noise control work including letters, sketches, and measurements for each piece of equipment.

TCF Centers "buy quiet" specification goal is to be less than 80 dBA at the operator's workstation. (Further information regarding *Buy-It-Quiet* specifications can be found in the American National Standards Institute document ANSI S 12.16-1992 (R1997) *Guidelines for the Specification of Noise of New Machinery.)*

Make-It-Quiet: The second element of the Noise Control Process addresses noise reduction of existing equipment through an *action plan*. The action plan includes the following elements:

Identification- A noise level survey of equipment, in conjunction with employee exposure data, identifies equipment targeted.

Evaluation- A review of noise control options is necessary. The review includes sources of information regarding existing control technologies, employee experience, equipment manufacturers and acoustics specialists.

Classification- The noise control of targeted equipment is to be classified as *feasible, infeasible, or indeterminate.* If feasible controls exist, a plan for implementation is required. If the noise control options are documented as infeasible, no further engineering control action is required unless there is some other benefit (i.e. ergonomic) to be gained. Indeterminate feasibility describes noise problems where there *may* be a control, but the impact is not fully known, and further study is required (i.e. developing a prototype).

Implementation Plan- Develop a plan of action that includes short-range project-type goals and on-going goals that require regular attention. The latter is discussed in the next section, *Keep-It-Quiet*. Prioritize the implementation plan:

1. Install feasible controls for noise sources contributing to employee exposures that exceed 90 dBA TWA.
2. Install controls where the greatest numbers of workers benefit.
3. Install feasible controls for noise sources contributing to employee exposures that are greater than 85 dBA TWA. This applies when the controls will reduce employee exposure by 5 dBA or to less than 85 dBA TWA.

Assign Responsibility- TCF Center maintains a written plan to document the organization's commitment to implement engineering controls. See chart below.

LOCATION	EQUIPMENT EVALUATED	RESPONSIBILITY	IMPLEMENTATION / ACTION / CONTROLS	TARGET DATE

Maintenance Shops; Applies to temporary Maintenance Locations throughout Building		*Individual, Carpenter; Plumber; HVAC; Electrician*	*Use proper TCF Center provided hearing protection devices while using all powered equipment; Noise control feasibility: high*	*Mandatory usage when tools are being operated*
Carpentry Maintenance Shop	Table Saw – 90dB	Carpenters	Foamable Ear Plugs with NRR 32 dB; Noise control feasibility: high	Mandatory usage when tools are being operated
Carpentry Maintenance Shop	Chop Saw – 104 dB	Carpenters	Earmuffs with NRR of 30 dB; Noise control feasibility: high	Mandatory usage when tools are being operated
Carpentry Maintenance Shop	Stationary Grinder on Metal – 112 dB	Carpenters, Plumbers, General Maintenance	Foamable Ear Plugs with NRR 32 dB *and* Earmuffs with NRR of 30 dB Noise control feasibility: high	Mandatory usage when tools are being operated
Carpentry Maintenance Shop	Hand Grinder on Metal – 103 dB	Carpenters, Plumbers, General Maintenance	Earmuffs with NRR of 30 dB; Noise control feasibility: high	Mandatory usage when tools are being operated
Plumbing Maintenance Shop	Pipe Grooving Machine – 87 dB	Plumbers	Foamable Ear Plugs with NRR 32 dB; Noise control feasibility: high	Mandatory usage when tools are being operated
Chiller Room	Chillers – 85 dB	All Employees	Foamable Ear Plugs with NRR 32 dB; Noise control feasibility: high	Mandatory usage when chillers and pumps are in active operation
Chiller Room	Gardiner Denver Air Compressors – 85 – 95 dB	All Employees	Foamable Ear Plugs with NRR 32 dB; Noise control feasibility: high	Mandatory usage when air compressors are in active operation
Equipment Monitoring performed with Calibrated Extech Sound Level Meter 407736; Settings - Range: Low - High; Response: Slow; Weighting Function "A"; Equipment tested on 2/19/2013 from distance of 2'-0" from source;				

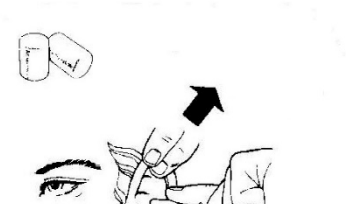
Keep-It-Quiet: The third element of a Noise Control Process involves on-going commitment to include noise controls into daily tasks. Employees must understand the importance of maintaining and caring for the engineering controls. On-going standard practices for maintenance should include:

- A common-systems approach to controlling noise problems and communication protocols
- Integrating noise control practices into production and maintenance tasks
- Increasing awareness for noise control opportunities

To ensure the elements of the Noise Control Process are functioning as intended, a Noise Control Committee should be formed, and *indices of program effectiveness* should be defined and tracked. These include reductions in noise exposure risk and incidence of Standard Threshold Shifts. Information on noise control can be found at http://www.cdc.gov/niosh/topics/noise/ and http://www.lni.wa.gov/Safety/KeepSafe/ReduceHazards/NoiseBank/default.asp.

3. Hearing Protection

When employees are exposed to sound levels at or exceeding the action level (85 dBA TWA) hearing protection devices (HPD) shall be provided. A pro-active Hearing Loss Prevention Program requires HPD use for all employees exposed at or exceeding the action level. Key factors to consider when purchasing HPD include comfort, fit, and problems caused by over-attenuation such as communication difficulties and the inability to hear warning signals.



Formable Plugs - Slowly roll and compress foam plugs into a very thin cylinder. While compressed, insert plug well into the ear canal. Fitting is easier if you reach around the head to pull the ear outward and upward during insertion.

Premolded Plugs - Reach around the back of your head and pull outward and upward on the ear while inserting the plug until you feel it sealing. This may seem tight at first, especially if you have never worn earplugs.

Earmuffs – Muffs must fully enclose the ears to seal against the head. Adjust the headband so cushions exert even pressure around the ears to get the best noise reduction. Pull hair back and out from beneath the cushions. Do not store pencils or wear caps under the cushions.

Courtesy of EAR

Noise Reduction Rating (NRR) The selected hearing protector must be capable of keeping the noise exposure at the ear below 85 dBA. Several methods exist for estimating the amount of sound attenuation a hearing protector provides. In the United States, the NRR is required by law [40 CFR 211] to be shown on the label of each hearing protector sold. The short method of determining the effective level from use of a protector involves subtracting from the exposure level (dBA) the NRR less 7 (to account for conversion from dBC to dBA).

NIOSH recommends using subject fit data based on ANSI S12.6-1997 [ANSI 1997] to estimate hearing protector noise attenuation. If subject fit data are not available, NIOSH recommends de-rating hearing protectors by a factor that corresponds to the available real-world data. The National Institute of Occupational Health and Safety (NIOSH) recommends that the labeled NRRs be derated as follows:

Earmuffs	Subtract 25% from the manufacturer's labeled NRR
Formable Earplugs	Subtract 50% from the manufacturer's labeled NRR
All Other Earplugs	Subtract 70% from the manufacturer's labeled NRR

For example, an employee is exposed to 99 dBA TWA and wears formable (foam) earplugs with a listed NRR of 26 dBA. Application of the above guidelines gives an effective NRR of 13 dBA. The employee's real-world exposure

is 99 – 13 = 86 dBA TWA. In this case, hearing protection with a higher NRR rating or reduction of noise exposure is required.

It is important for employees to properly insert and fit earplugs to obtain the greatest protection possible. Consult the hearing protection manufacturer for information on proper training and fitting of HPD. The NIOSH Compendium of Hearing Protection Devices is available at http://www.cdc.gov/niosh/topics/noise/.

4. Education and Notification

Noise Exposure Postings- Clearly visible warning signs are posted at the entrance of areas where noise exposures equal or exceed 85 dBA TWA. The warning signs contain textually or graphically contain the following information:

DANGER!!!

NOISE AREA
HEARING HAZARD

Use of Hearing Protectors Required

All postings shall conform to the MIOSHA General Industry Safety Standard Part 37, *Accident Prevention Signs and Tags*.

Notification- All workers who are exposed to noise at or above 85 dBA TWA shall be informed about the potential consequences of noise exposure and the methods of preventing noise-induced hearing loss (NIHL). When noise measurements identify noise hazards, workers shall be notified in writing within 30 days. New workers shall be alerted to the presence of hazardous noise before they are exposed to it. MIOSHA requires that a copy of the Occupational Noise Exposure rules be posted in the workplace. Posted as attachment to this Hearing Loss Prevention Program.

Training- TCF Center institutes a training program in occupational hearing loss prevention for all workers who are exposed to noise at or above 85 dBA TWA. The training must be repeated annually for each worker enrolled in the program. The training includes:

1) The physical and psychological effects of noise and hearing loss
2) Hearing protector selection, fitting, use and care
3) Audiometric testing

The roles and responsibilities of both TCF Center and employees in preventing hearing loss should be well defined. Workers who have demonstrated a Standard Threshold Shift shall be refitted and retrained in the proper use of hearing protectors. Details of health effects of excessive sound exposure can be found at http://www.cdc.gov/niosh/topics/noise/.

5. Audiometric Evaluation

Occupational hearing loss occurs gradually and is typically not accompanied by pain. Audiometric evaluations, or hearing tests, are required to determine of occupational hearing loss has occurred. By comparing *baseline* and *annual audiograms*, threshold shifts are discovered, and the beginning of hearing loss is detected.

The purpose of audiometric testing is to trigger prompt protective measures and motivate employees to prevent hearing loss.

The baseline audiogram is the reference audiogram against which future hearing tests are compared. It must be provided within six months of an employee's first exposure at or above 85 dBA TWA. Annual audiograms must be conducted within one year of the baseline. The term "Standard Threshold Shift" describes an *average* change in hearing from the baseline audiogram levels of 10dB or more for the frequencies of 2000, 3000, and 4000 Hz. When a Standard Threshold Shift has been determined, the MIOSHA Occupational Noise Exposure rules require certain actions. These include a retest, an evaluation of the adequacy of hearing protectors, and/or the requirement to use HPD. Audiograms should be performed on the following occasions:

- Pre-employment (baseline) and before initial assignment to a high noise area
- Annually when the employee is assigned to a job *where the noise exposure exceeds 85 dBA TWA*
- Reassignment out of a hearing hazardous job
- Termination of employment

TCF Center shall support audiometric evaluations by allocating sufficient resources. Mobile test providers or a local hearing clinic may contract audiometric services. A licensed audiologist, otolaryngologist or physician must be responsible for the program. This includes overseeing the work of technicians who administer the audiograms, reviewing problem audiograms, and determining whether a referral is necessary.

Program administrators must ensure that the reviewed audiometric record indicates:

1. The specific purpose of the audiometric examination: for example, baseline, annual, retest, threshold shift confirmation or other
2. The specific equipment used and most recent calibration date
3. The name of the tester
4. The date and time of day of the test (which work shift)
5. The auditory history information
6. The hearing threshold values obtained
7. The tester's judgment of the subject's response reliability
8. The results of the protector inspection and a record of any refitting, reissuing, or retraining
9. The tester's comments if any

Audiograms should not be given after the subject had been exposed to noise. For this reason, it is best to schedule hearing tests at the beginning of the work shift.

6. Recordkeeping

Hearing loss prevention program records include documentation of all items for each element of the program:

1. Noise exposure monitoring
2. Noise control process
3. Hearing protection
4. Education and notification

5. Audiometric evaluation
6. Record keeping
7. Program evaluation

Noise exposure records shall be maintained for at least two years and audiometric test records shall be maintained for at least the duration of employment.

Rule 1115 of Part 11 *Recording and Reporting of Occupational Injuries and Illnesses* requires TCF Center to record a work-related STS under Column five on the MIOSHA 300 Log if the employee's total hearing is 25 dB or more above audiometric zero (averaged at 2000, 3000, and 4000 Hz) in the same ear as the STS. An example protocol for determining STS recordability (if at any step a "no" is encountered, the process ends, and the hearing change is not recorded on the Form 300):

Step 1: Compare the original baseline audiogram or last audiogram showing a recordable shift in hearing; is there an STS in either ear (age adjustments allowed)? If yes continue to Step 2.

Step 2: Is the average hearing level on the current hearing test in 2000, 3000, and 4000 Hz in the same ear greater than or equal to 25 dB HL (no age adjustment allowed)? If yes, continue to Step 3.

Step 3: Is the STS confirmed upon 30-day retest (or was a retest not conducted)? If yes, continue to Step 4.

Step 4: Record the case on MIOSHA Form 300 within 7 days of retest (or within 37 days of test if retest is not conducted), unless a physician other licensed health care professional has determined that the shift in hearing is not work related (i.e. hearing loss has not been significantly aggravated by occupational noise exposure).

7. Program Evaluation

Hearing loss prevention programs require periodic evaluation to assure their effectiveness. A comprehensive hearing loss prevention checklist is available from the NIOSH document, *Preventing Occupational Hearing Loss*, available by calling (800) 35-NIOSH. The most current Hearing Conservation Checklist is available at http://www.cdc.gov/niosh/topics/noise/.

TCF Centers, employees and other interested parties may obtain information about the MIOSHA Occupational Noise Exposure Standard by contacting the MIOSHA Consultation Education and Training, 7150 E. Harris Drive, Lansing, Michigan 48909, (517) 322-1809. Occupational health standards for general industry, including the MIOSHA Occupational Noise Exposure Standard are available on-line at http://www/michigan.gov/mioshastandards.

References

Assistance and information on the health hazards of noise, noise monitoring, audiometric testing and noise controls are also available from industrial hygienists, occupational safety and health consultants, audiometric testing services, audiologists, and insurance carriers. A good overview of the nature and scope of noise and hearing is provided by the following document:

Berger, E.H., Royster, L.H., Royster J.D., Driscoll, Layne, M. (Eds.) (2000). The Noise Manual. (5th) ed. Fairfax, VA: AIHA Press.

The following free publication is available from the National Institute for Occupational Safety and Health (NIOSH), 1(800) 35NIOSH:

U.S. Department of Health and Human Services Centers for Disease Control and Prevention NIOSH. (1998). Criteria for A Recommended Standard Occupational Noise Exposure. Cincinnati, OH. Publication No. 98-126.

Hearing Conservation Program administration guidelines and other references used in development of this summary:

Megerson, S.C. (2002). OSHA's Final Rule for Recording Occupational Hearing Loss. The Newsletter of the Council for the Accreditation in Occupational Hearing Conservation Update, 14(3), 1, 3, and 10.

Anderson, RR, Brogan, PA, (1994). "Industrial Noise Control Process", National Hearing Conservation Association Annual Conference.

Franks, JR, Stephenson, MR, and Merry, CJ (1996). "Preventing Occupational Hearing Loss- A Practice Guide," U.S. Dept. of HHS (NIOSH) Rept. 96-110.

Royster, JD and Royster, LH (1990). Hearing Conservation Programs: Practical Guidelines for Success, Lewis Pub., Chelsea, MI

TCF Center Program Designed from Example obtained on line "MIOSHA CET 5620- Hearing Loss Prevention Programs" http://www.michigan.gov/lara/0,4601,7-154-61256_11407_15333_46807-174642--,00.html

Courtesy of:
Michigan Department of Licensing and Regulatory Affairs
Michigan Occupational Safety & Health Administration, Consultation Education & Training Division

Infection Control/BBP

Employees Covered by the Program

TCF Center has established this Bloodborne Pathogen Program and written exposure-control plan in accordance with OSHA standard 29 CFR 1910.1030. This program is for the employees that occasionally have reasonably expected exposure to blood or other potentially infectious bodily fluids.

Exposure Determination

Using past experience as its guide, ASM Global has assessed the exposure to its employees working at TCF Center and has concluded that housekeeping personnel, plumbers and personnel trained to provide CPR and AED assistance are at a small risk of exposure to potentially infectious blood or bodily fluids. Despite this low risk, ASM Global wants to ensure its employees benefit from the protection offered by OSHA's Bloodborne Pathogen Standard.

With respect to housekeeping, ASM Global believes that it is reasonably anticipated that exposure is possible during the very frequent clean-up of blood or other potentially infectious bodily fluids or the exposure to blood

or other potentially infectious bodily fluids through a cut or open wound. Concerning sharps, to the best of management's knowledge, there have been no documented incidents of finding discarded used syringes. Those designated and trained to provide CPR can possibly be exposed to bodily fluids if they respond to an unresponsive victim who has suffered an injury such as a broken nose. Although these CPR trained employees are under no legal obligation to provide CPR under current "Good Samaritan" laws in Michigan, ASM Global wants these individuals to be protected by the requirements in 1910.1030. ASM Global understands that the specific training and protections afforded by the standard will enhance the overall employee and public safety of TCF Center.

The OSHA standard excludes employees who perform unanticipated "Good Samaritan" acts from coverage since such an action does not constitute "occupational exposure". However, should such an act done by an ASM Global employee not previously trained (or trained outside of ASM Global), they too will be provided with post exposure counseling, post exposure vaccination including HBV and HIV (as applicable), as recommended by a physician during medical counseling concerning the incident.

Program Implementation and Maintenance Responsibilities

The Human Resources Director will oversee the implementation and ongoing maintenance of this exposure control and post exposure protection program. All requisite documentation will be maintained by the HRD or his/her designee. The exposure-control plan **(See Attached)** will be reviewed at least annually, after any exposure event and updated as personnel and responsibility changes necessitate. The review and updating process will include soliciting input from the designated and trained CPR persons as well as key housekeeping personnel. ASM Global personnel who have received CPR training have options when providing basic CPR. These options include CPR involving mouth-to-mouth resuscitation and/or stand-alone chest compression. Whether or not to provide CPR - and deciding what type of CPR - is at the discretion of the provider involved. ASM Global's training and policy is that the CPR provider's safety is paramount and that no one should feel compelled to provide any assistance if they are uncomfortable with the circumstance or otherwise unprepared. It is ASM Global's policy that in the event CPR is necessary, the prospective CPR provider will immediately call or task someone to immediately call 911 just prior to or while CPR is being performed.

It is understood that the CPR provided by ASM Global is done so on a voluntary basis. ASM Global believes the personnel it trained to provide CPR and AED assistance were done so in accordance with the precepts of the Good Samaritan law. CPR training is not an ASM Global requirement or part of any job duty or description. Under no circumstances would a trained CPR provider who decides NOT to provide CPR be disciplined or suffer any negative consequences of any kind.

Employee Training

TCF Center will provide training on bloodborne pathogens exposure, by a qualified medical professional, to all employees involved in housekeeping activities, plumbers as well as those who have been trained to provide CPR and AED assistance in accordance with the American Heart Association. Employees will receive this training annually. In the rare instance that a housekeeping employee has not yet been trained, they will be instructed to not be involved in blood clean-up until such time that they have received the requisite training.

ASM Global employee training will focus on the following essentials:

1) The OSHA standard and its basis
2) Expectations and limitations of response to ensure worker safety
3) Types and transmission of bloodborne pathogens
4) Universal precautions as it applies to exposure incidents.
5) Use of personal protective equipment (PPE).
6) Safe handling of needles and other sharps.
7) Medical waste disposal procedures.
8) Post-exposure treatment and procedures.
9) HBV vaccinations.
10) A general explanation of the epidemiology and symptoms of bloodborne diseases.
11) An explanation of the modes of transmission of bloodborne pathogens.
12) An explanation of the employer's exposure control plan and the means by which the employee can obtain a copy of the written plan.
13) An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment.
14) Information on the types, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment.
15) An explanation of the basis for selection of personal protective equipment.
16) 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.
17) Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials.
18) An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available.
19) Information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident.
20) An opportunity for interactive questions and answers with the person conducting the training session.

Required Safe Work Practices

Supervisors shall ensure that their employees are familiar with the concept of universal precautions, the use of personal protective equipment, and safe cleanup and disposal techniques. Additionally, all employees who have been identified as having reasonably anticipated exposure will be offered the HB vaccine in accordance with the current standard medical practice as recommended by the CDC. This includes pre and post exposure offerings as required. Confidential post exposure follow-up medical counseling will be offered in accordance with 1910.1030 in the rare instance where an “exposure” (as defined in 1910.1030) occurs. This counseling will also be offered in cases when an incident results in questionable “exposure” as defined in 1910.1030 is inconclusive as well.

Personal Protective Equipment

Housekeeping personnel shall have impervious gloves and eye protection (goggles) available. This PPE must be worn while cleaning up a blood spill. It is ASM Global’s policy that its housekeeping personnel will only be cleaning up “incidental” spills of blood. Although it is difficult to quantify the term “incidental”, ASM Global believes that an incidental spill on an impervious surface is approximately two square feet or somewhat less than one pint of blood. PPE required for housekeeping personnel is always available in the “housekeeping shop”. PPE

for CPR providers, including gloves and mouth shields, are available in the security office. ASM Global will ensure that such PPE is readily accessible as required by OSHA.

ASM Global will provide PPE distribution at strategic locations throughout the coliseum.

The Director of Housekeeping and his/her designee are responsible for ensuring the availability of the required personal protective equipment. Eye and hand protection are already required by housekeeping personnel for most cleaning work.

The use of an EPA registered antimicrobial product effective against *Mycobacterium tuberculosis*, Human HIV-1 and Hepatitis B Virus will be used by ASM Global housekeeping personnel to dilute and render the spilled blood non-infectious.

Hand Washing

ASM Global will ensure that employees wash their hands immediately - or as soon as possible - after removal of gloves or other personal protective equipment following the clean-up of a blood spill. ASM Global has distributed and will continue to distribute in strategic locations, hand sanitizing lotions.

Hepatitis B (HBV) Vaccinations

TCF Center will offer, at its own expense, hepatitis B vaccinations to employees covered under this program and who choose to be vaccinated. These vaccinations will be offered and provided as prescribed by the most current Center for Disease Control (CDC) guidelines for administration to ensure standard medical practices are followed. All housekeeping and trained CPR providers will be offered the vaccine.

The DOO, or his/her designee, will document that the vaccine is offered as well as the employees' decision to accept or decline the vaccination. Copies of signed declination forms will be kept by the DOO or his/her designee. It is understood and conveyed to those covered by this program that they may change their minds about receiving the HBV vaccine at any time.

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 shall be part of the training provided to housekeepers and CPR trained employees.

Reporting an Incident

Any employee, including housekeeping personnel, who identifies a blood spill has been trained to report the incident immediately to their supervisor and not proceed to clean the blood until management has been notified and has had the opportunity to assess the conditions. Training includes the requirement to isolate the spill using any readily available means possible to assure it is not disturbed or spread by foot traffic until it has been assessed and clean-up has begun. In the rare event the blood spill is too large to be safely handled by ASM Global housekeeping staff, ASM Global will acquire outside assistance from a specialized cleaning contractor. CPR personnel involved in an incident will coordinate with 911 responders and then report it to their supervisor as soon as practicable following the incident.

Sharps (Syringe) Handling

Housekeeping personnel will be trained to never carry a sharp or syringe (needle). The procedure will be to notify supervision immediately so that a suitable container – a sharps container meeting the requirements of 1910.1030 - is brought to the syringe. This policy will reduce the chance of an exposure caused by unnecessary potentially hazardous handling of the sharp.

Post Exposure Follow-up

ASM Global shall make available the hepatitis B vaccine and vaccination series to all employees who have been trained in CPR as well as those designated housekeepers who have had the training necessary to safely handle the clean-up of blood or other body fluids. A post-exposure evaluation and follow-up to all employees who have had an exposure incident will also be offered.

ASM Global shall ensure that all medical evaluations and procedures including the hepatitis B vaccine and vaccination series and post-exposure evaluation and follow-up, including prophylaxis, are:

1) Made available at no cost to the employee.
2) Made available to the employee at a reasonable time and place.
3) 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 take place, except as specified by this paragraph (f) for all follow-up actions including the extremely unlikely need to offer HIV vaccinations.
4) ASM Global shall ensure that all laboratory tests are conducted by an accredited laboratory at no cost to the employee.

Record-Keeping

Exposure to bloodborne pathogens (an exposure incident as defined by the standard) will be recorded on the OSHA 300 log if a doctor prescribes treatment with gamma globulin, HBV immune globulin or HBV vaccine. In the event of an incident that does NOT result in an exposure as defined in 1910.1030, ASM Global will conduct an accident investigation and the results of that investigation will be available to the employees and to OSHA upon request. HBV vaccination records will be confidential and kept as required by 1910.1030. A copy of this program will be made available to employees and to OSHA upon request. HBV declination forms will be kept on file for the duration of employment.

TCF-ASM Global
EXPOSURE CONTROL PLAN (ECP) FOR BLOODBORNE PATHOGENS

Purpose

This document serves as the written procedures for the Bloodborne Pathogens Exposure Control Plan (ECP) for TCF Center. These guidelines provide policy and safe practices to prevent the spread of disease resulting from handling blood or other potentially infectious materials (OPIM) during the course of work. This ECP has been developed in accordance with the OSHA Bloodborne Pathogens Standard, 29 CFR 1910.1030. The purpose of this ECP includes. Eliminating or minimizing occupational exposure of employees to blood or other potentially infectious material. • Complying with OSHA's Bloodborne Pathogens Standard, 29 CFR 1910.1030.

Administrative Duties

The Director of Human Resources is responsible for developing and maintaining the program. Employees may review the plan by obtaining a copy from their supervisor, the Housekeeping Operations Manager, or the Engineering office. In addition, the Director of HR is responsible for maintaining any records related to the Exposure Control Plan.

Responsibility

Ensure all affected employees receive training on an annual basis. Update all job listings to include personnel who have the potential to be exposed. Provide advice and assistance to Departments, and Supervisors who have affected employees.

Develop a written program for affected employees supplementing TCF Center's Exposure Control Plan. Report all exposures on the Supervisors Accident Investigation Report and ensure the Hepatitis B immunization is offered to all eligible employees. If they decline, maintain a copy of the declination form (Appendix A) in the employee's medical files. Assistance in scheduling the immunization can be obtained by calling the Human Resources Dept. Provide required training to affected employees on an annual basis. This can be accomplished through the Manager and the Human Resources Department. Maintain training records for affected employees. Provide the Manager and Human Resources with a listing of said employees. Provide personal protective equipment as needed.

Exposure Determination

TCF Center has determined which employees may incur occupational exposure to blood or other potentially infectious bodily fluids (OPIM). The exposure determination is made without regard to the use of personal protective equipment (i.e., employees are considered to be exposed even if they wear personal protective equipment).

Job Classes:

Function-Specific Risk of Exposure In addition, we have identified job classifications in which some employees may have occupational exposure. Not all employees in these categories are expected to have exposure to blood or OPIM. Therefore, tasks or procedures that would cause occupational exposure are also listed to further specify which employees have occupational exposure.

The job classifications and associated tasks for these categories are as follows: Housekeeping, Plumbers, Security and First Aid and Arresting Activities.

Universal precaution techniques developed by the Centers for Disease Control and Prevention (CDC) will be observed at this facility to prevent contact with blood or OPIM. All blood or OPIM will be considered infectious regardless of the perceived status of the source individual.

Engineering and Work Practice Controls

Engineering and work practice controls will be used to eliminate or minimize exposure to employees at this facility. Where occupational exposure remains after institution of these controls, employees are required to wear personal protective equipment. At this facility, the following engineering controls are used:

• Placing sharp items (e.g., needles, scalpels, etc.) in puncture-resistant, leak-proof, labeled containers.

• Performing procedures so that splashing, spraying, splattering, and producing drops of blood or OPIM is minimized.

• Cleaning and disinfecting all equipment and work surfaces potentially contaminated with blood or OPIM.

• Thorough hand washing with soap and water immediately after providing care or provision of antiseptic towelettes or hand cleanser where handwashing facilities are not available. Use of leak-proof, labeled containers for contaminated disposable waste or laundry.
• All potentially infectious material and contaminated PPE will be properly disposed. The above controls are examined and maintained on a regular schedule.

Hand Washing Facilities & Eye Wash Stations

Hand washing facilities are available to employees who have exposure to blood or OPIM. Sinks for washing hands after occupational exposure are located in every restroom. When circumstances require hand washing and facilities are not available, either an antiseptic cleanser and paper towels or antiseptic towelettes are provided. Employees must then wash their hands with soap and water as soon as possible. Supervisors must ensure that employees wash their hands and any other contaminated skin after immediately removing personal protective gloves, or as soon as feasible with soap and water. Supervisors also must ensure that if employees' skin or mucous membranes become contaminated with Eye wash stations are located in the Engineering Inventory Control room and near the battery fill station.

Sharps

Housekeeping Employees may not bend, recap, remove, shear, or purposely break contaminated needles and other sharps. Additionally, if need be, employee must remove the needle by using a mechanical device or a one-hand technique.
During use, containers for contaminated sharps shall be easily accessible to personnel and located as close as possible to the immediate area where sharps are used or can be reasonably anticipated to be found (e.g., Restrooms). The containers are kept upright throughout use and replaced routinely and not allowed to be overfilled. A third-party Vendor is responsible for the proper removal and disposal of the contents of the sharp containers. When moving containers of contaminated sharps from the area of use, the containers are closed immediately before removal or replacement to prevent spills or protrusion of contents during handling, storage, transport, or shipping. Once sharp containers are filled, employees should contact Housekeeping to arrange for infectious waste disposal.

Contaminated Equipment

Contaminated Equipment requires that equipment which has become contaminated with blood or OPIM must be decontaminated before servicing or shipping as necessary unless the decontamination of the equipment is not feasible. Our procedures for equipment decontamination are as follows: All equipment used to cleanup blood or OPIM will be decontaminated prior to reuse or storage. This includes all equipment used during spill cleanup and other such equipment (e.g. mops, brooms, scrub brushes, etc.). Disinfectant and germicidal sprays can be used for decontaminating equipment. A small amount of liquid bleach may also be used. All equipment not decontaminated will be considered contaminated and will be properly disposed of according to this plan.

Personal Protective Equipment
All personal protective equipment (PPE) used at this facility is provided without cost to employees. PPE is chosen based on the anticipated exposure to blood or OPIM. The protective equipment is considered appropriate only if it does not permit blood or OPIM to pass through or reach the employees' clothing, 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.
TCF Center makes sure that appropriate PPE in the appropriate sizes is readily accessible at the work site or is issued without cost to employees by: All necessary PPE is located within spill cleanup kits or can be obtained

through immediate supervisors and/or the Manager. TCF Center purchases (when consumable), cleans, launders, and/or disposes of personal protective equipment as needed.
Employees must remove all garments which are penetrated by blood immediately or as soon as possible, and they must remove all PPE before leaving the work area. When PPE is removed, employees must place it in a designated container for disposal, storage, washing, or decontamination.
Gloves Employees must wear gloves when they anticipate hand contact with blood, OPIM, non-intact skin, and mucous membranes, when performing vascular access procedures, and when handling or touching contaminated items or surfaces. Used disposable gloves used are not to be washed or decontaminated for re-use and are to be replaced as soon as practical. Further, they are to be replaced when torn, punctured, or when their ability to function as a barrier is compromised.
Eye and Face Shields Employees must wear face shields in combination with eye protective devices, such as goggles or glasses, whenever splash, splatter, or droplets of blood or OPIM may be generated and reasonably anticipated to contaminate eye, nose, or mouth.

Housekeeping

All equipment and surfaces are cleaned and decontaminated with appropriate disinfectant after contact with blood or OPIM. Contaminated surfaces are cleaned and decontaminated immediately following or as soon as possible after the spill has been picked up and/or removed.
All protective coverings (e.g. plastic wrap, aluminum foil, imperviously backed absorbent paper) is removed and replaced as soon as possible when they are contaminated.
All reusable bins, pails, cans, and similar receptacles are inspected and decontaminated on a regularly scheduled basis or as soon as possible upon visible contamination. Additional housekeeping requirements to prevent the spread of bloodborne pathogens include: Any broken glassware which may be contaminated will not be picked up directly with the hands. Reusable sharps that are contaminated with blood or OPIM are not stored or processed in a manner that requires employees to reach by hand into the containers where these sharps have been placed.

Information & Training

We make sure that employees covered by the bloodborne pathogens standard are trained at the time of initial assignment to tasks where occupational exposure may occur, and every year thereafter. Training is tailored to the education and language level of the employee and offered during the normal work shift. The training is interactive and covers the following:

- The epidemiology and symptoms of bloodborne diseases.
- The modes of transmission of bloodborne pathogens.
- TCF Center Bloodborne Pathogen ECP, and a method for obtaining a copy.
- The recognition of tasks that may involve exposure.
- The use and limitations of methods to reduce exposure, for example engineering controls, work practices and personal protective equipment (PPE).
- The types, use, location, removal, handling, decontamination, and disposal of PPE.
- The basis of selection of PPE.
- The Hepatitis B immunization, including efficacy, safety, method of administration, benefits, and that it will be offered free of charge.
- The appropriate actions to take and persons to contact in an emergency involving blood or OPIM.

- The procedures to follow if an exposure incident occurs, including the method of reporting and medical follow-up.
- The evaluation and follow-up required after an employee exposure incident.

Additional training is provided to employees when there are any changes of tasks or procedures affecting the employee's occupational exposure. Employees who have received training on bloodborne pathogens in the 12 months preceding the effective date of this plan will only receive training in provisions of the plan that were not covered.

Recordkeeping

Training records shall be maintained for three years from the date of training. The following information shall be documented: The dates of the training sessions. An outline describing the material presented. The names and qualifications of persons conducting the training. The names and job titles of all persons attending the training sessions.
All employee records shall be made available to the employee in accordance with 29 CFR 1910.20. All employee records shall be made available to the Assistant Secretary of Labor for the Occupational Safety and Health Administration and the Director of the National Institute for Occupational Safety and Health upon request.

Hepatitis B Immunization Program

TCF Center offers the Hepatitis B immunization series to all employees who have occupational exposure to bloodborne pathogens, and post exposure follow-up to employees who have had an exposure incident.
All medical evaluations and procedures including the Hepatitis B immunization series and post exposure follow up 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. Henry Ford Health Center will administer the Hepatitis B immunization series.
• Provided according to the recommendations of the U.S. Public Health Service.
All employees who decline the Hepatitis B immunization series offered must sign the OSHA-required waiver indicating their refusal.
If a routine booster dose of Hepatitis B immunization is recommended by the U.S. Public Health Service at a future date, such booster doses will be made available.

Post-Exposure Evaluation and Follow-Up

All exposure incidents are reported, investigated, and documented. When the employee is exposed to blood or OPIM, the incident is reported to immediate supervisors. When an employee is exposed, he or she will receive a confidential medical evaluation and follow-up. A statement that the employee has been informed of the results of the evaluation and a statement that the employee has been told about any medical conditions resulting from exposure to blood or OPIM which require further evaluation or treatment.

Definitions

For purposes of this procedure, the following shall apply:

Blood means human blood, human blood components, and products made from human blood.
Bloodborne Pathogens means pathogenic microorganisms 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 means a workplace where diagnostic or other screening procedures is performed on blood or other potentially infectious materials.
Contaminated means the presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface. Contaminated Laundry means laundry that has been soiled with blood or other potentially infectious materials or may contain sharps. Contaminated Sharps means any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires. Decontamination means 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 means controls (e.g., sharps disposal containers, self-sheathing needles, safer medical devices, such as sharps with engineered sharps injury protections and needleless systems) that isolate or remove the bloodborne pathogens hazard from the workplace.
Exposure Incident means a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

Eye washing stations and Handwashing Facilities means a facility providing an adequate supply of running potable water, soap and single use towels or hot air-drying machines.
Licensed Healthcare Professional is a person whose legally permitted scope of practice allows him or her to independently perform the activities required by paragraph (f) Hepatitis B Immunization and Post-exposure Evaluation and Follow-up.

HBV means hepatitis B virus.

HIV means human immunodeficiency virus.

Occupational Exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Other Potentially Infectious Materials means (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, anybody 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, organ 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.

Parenteral means piercing mucous membranes or the skin barrier through such events as needle sticks, human bites, cuts, and abrasions. Personal Protective Equipment is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Sterilize means the use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores. Universal Precautions is 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 means controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

APPENDIX A

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 hepatitis B virus (HBV) infection. 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 hepatitis B vaccine, I can receive the vaccination at no charge to me.

Signature of employee: _____

Print name of employee: _____

Witness signature and position: _____

Ladder Safety

PURPOSE

Establish procedures to assure the highest level of safety and health while maintaining programs consistent with ASMG Best Practices.

DEFINITIONS

- **Portable ladders** - Portable ladders are any ladders which are transportable by any means not just physical carrying.
- **Portable metal ladders** – Ladders made in whole of a metallic material as in aluminum or steel (Not allowed in use).
- **Portable wood ladders** – Ladders made in whole of a wood product (Note allowed in use).
- **Portable fiberglass ladders** – Ladders are made of fiberglass with aluminum steps. These ladders are considered non-conductive due to the design (Only ladder construction allowed).

- **Step ladder** – Stepladder is a self-supporting portable ladder, non-adjustable in length, with flat steps and a hinged back.
- **Extension ladder** – Extension ladders are non-self-supporting portable ladders that are adjustable in length.

REFERANCES

OSHA 1910.25 Portable Wooden Ladders
OSHA 1910.26 Portable Metal ladders
OSHA 1926.1053 Stairways and Ladders

ACTION PLAN

Portable ladders should be inspected at frequent, regular intervals and maintained in good condition, free from oil, grease, or other slippery materials. Defective ladders should be removed from service until repaired. At the Salt Palace Convention Center (SPCC), South Towne Exposition Center (STEC), and The Equestrian Park (EPEC) all portable ladders will be inspected before use and the results of that inspection documented in the form found in Appendix A. Those which cannot be repaired will be tagged "DO NOT USE" until they can be discarded.

Care should be taken while setting up extension ladders, ensuring that a proper angle is maintained. A simple rule for setting up a ladder is to place the base out from vertical a distance of one-fourth the length of the ladder. For example, if a ladder is being used to reach a height of 8 feet, the base should be set out 2 feet from vertical to achieve a proper angle. See illustration in Figure 1 below.

Ladders should always be placed on stable bases. Boxes, barrels, or other unstable surfaces should never be used to obtain additional height. Additionally, ladders should not be placed on slippery surfaces unless secured by holding or lashing. All use of portable ladders over 10 feet high will require two employees. One employee will help secure the ladder at its base.

RESPONSIBILITY

The Department Manager shall be responsible for the implementation and communication of this program.

PORTABLE WOODEN LADDERS

TCF Center Detroit are phasing out the use of portable wooden ladders. At this point no portable wooden ladders are in service. TCF Center Detroit currently pursuing a policy of buying and using only fiberglass ladders.

PORTABLE METAL LADDERS

TCF Center Detroit are phasing out the use of portable metal ladders. At this point no portable metal ladder should be in service. TCF Center Detroit currently pursuing a policy of buying and using only fiberglass ladders.

CRITERIA FOR LADDER PURCHASE

- Buy only “heavy duty” ANSI Type 1 industrial fiberglass ladders
- Use only Underwriter’s Laboratory approved ladders (look for the UL seal).

STEPS FOR SAFEST LADDER USAGE

- Be sure step ladders are fully open and locked before climbing them – see Stepladder section
- Place ladder on a flat, secure surface.
- Place ladder on a hard surface as it will sink into a soft surface.
- Place ladder on non-movable base.
- Lean ladder (designed to be leaned) against a secure surface, not boxes or barrels.
- Do not place ladder in front of a door.
- Position base of ladder one foot away for every four feet of height to where it rests.
- Ladder rails should extend at least three feet above top landing.
- Check shoes to ensure they are free of grease or mud.
- Mount the ladder from the center, not from the side.
- Face ladder when ascending or descending and hold on with both hands.
- Carry tools in pockets, in a bag attached to a belt, or raised and lowered by rope.
- Do not climb higher than the third rung from the top.
- Work facing the ladder.
- Do not overreach, always keep your torso between the ladder rails.
- When using ladder for high places, securely lash or fasten the ladder to prevent slipping.
- Avoid outdoor ladder use on windy days.
- Avoid aluminum ladders if work must be done around electrical wires or power lines

Proper Procedure

Before working with a ladder, read the manufacturer's instructions. Do not use ladder if sleepy or ill, if you are taking medication, or if there's bad weather. Do not use ladders in doorways or other high-traffic areas. If a ladder must be used near a door, make sure the door is locked. If the door has to be open or the ladder is in a raised position, ask a coworker to stay with the ladder to make sure an accident does not occur. Use fiberglass or wood ladders, rather than metal, near power lines or other sources of electricity to avoid electrical shock hazards.

Inspection

A ladder should be thoroughly inspected each time it is used. Rungs should be firm and unbroken, braces fastened securely, and ropes, pulleys, and other moving parts in good working order. If an inspection reveals damage, the ladder should be repaired. If repairs are not feasible, the defective ladder should be taken out of service. To ensure that ladders are being inspected, ladder inspection tags containing the information below in Appendix A will be filled out and attached to the ladder.

SEE LADDER INSPECTION CHECKLIST

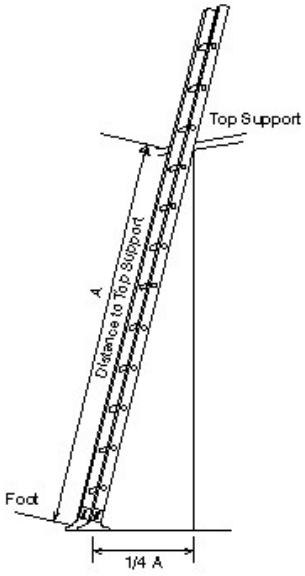
Proper Setup

The feet of a ladder should be level and positioned solidly on the ground. If the ground is soft or uneven, use boards under the legs for support. Test the ladder to verify that it is secure. For stability, both sides of the ladder need to be against the wall or other support. The legs on a stepladder should be spread fully and locked into position. As stated in the regulatory requirements above, ladders should be placed at a 75-degree angle.

How to Climb

Make sure hands, shoes and ladder rungs are dry. Use a second person to hold the bottom of the ladder and prevent others from disturbing ladder. Keep a three-point grip on the ladder at all times (two hands and one foot or one hand and two feet). Avoid distractions that make you turn away from the front of the ladder. Climb slowly with weight centered between side rails. Do not lean back, and never stand on the top two rungs of a stepladder or top four rungs of an extension ladder.

The illustration below depicts the correct angle of repose for a ladder using one quarter of the ladder height to the elevated surface being accessed



Maximum Ladders

Type of Ladder	Duty Type	Max Length
Extension Ladder 2 Section	Heavy Duty – Type I	60 Feet
A-Frame Step Ladder	Heavy Duty – Type I	20 Feet

STEP LADDER SAFETY

- Always inspect a ladder prior to use to ensure it is in good condition. Do not use the ladder if it has cracked, broken or missing rungs or side rails, or has loose components.

Tag it “Do Not Use” and have it removed from service for either repair or destruction.

- If any chance of coming in contact with live electrical wires, do not use steel or aluminum ladders as they easily conduct electricity. Fiberglass ladder.
- All ladders are weight-rated. Do not exceed the weight capacity rating as this will only weaken the ladder and cause potential injury.
- Do not use painted wooden ladders, as the paint can conceal flaws.
- If using wooden ladders, ensure they are free from any splinters.
- Always be cognizant of any moving machinery in the area. Forklifts, trucks, or scissor lifts can pose a real safety hazard. Take the appropriate precautions.
- Ensure that the steps of the ladder are free of any debris, materials, tools, grease, or other substances that could cause you to slip or lose your footing. Likewise, ensure your footwear is free of any slippery substances.
- Ensure that the ladder is not on uneven, unstable, or soft ground as this can cause it to tip.
- Avoid placing ladders on slippery surfaces as this can result in the ladder shifting and the worker losing balance.
- If extra height is needed, get the appropriate ladder. Never place ladders on top of unstable items to obtain extra height.
- No one should climb on the back bracing of the ladder. These are not steps.
- Only one worker at a time on any step ladder unless the ladder is specifically designed for dual access.
- Prior to ascending a ladder, be sure that it is fully open with the spreader arms fully extended and locked in place; otherwise it can tip and fall sideways.
- When ascending or descending a ladder and when working on it, always face the ladder. If you must turn sideways to perform work, as in drilling into a wall, use extreme caution as this can potentially be very dangerous with the worker pushing them self and the ladder sideways and tipping the ladder or losing balance and falling.
- Use both hands when ascending or descending a ladder. Always have three points of contact with the ladder for proper balance.
- When ascending or descending ladders, caution needs to be exercised in carrying tools, equipment, material, or anything heavy. It would be safer to carry Items in a tool belt, in your pockets, or handed up to you by a co-worker.
- Ensure your boot laces are tied up and not hanging. You do not want to step on them when ascending or descending a ladder, as this can cause you to slip or lose your balance.
- Do not stand or sit on the top two rungs of a step ladder. Doing so extends a worker past the center of gravity and can easily fall. If you require more height, get a taller ladder.
- When ascending a ladder, look up to see what is above your head. You do not want to get injured by any sharp object that may be hanging down.
- When working from a ladder, do not over-reach as this can cause you to lose your balance and fall. Applying the “belt-buckle rule,” keep the center of your body inside the side rails of the ladder. If, by reaching to the side, your belt buckle extends past either side rail, you need to climb down and move the ladder.

- When working on a finished floor that may mark easily, ensure all rubber feet of the ladder are intact and no bare metal showing. You can also attach “booties” for extra precaution against marking the floor or place on clean cardboard.
- It is not a good practice to lean a closed step ladder against a wall to do work from, unless there is no other option, and it is securely braced. On some work sites it is strictly forbidden.
- Extreme caution should be used when performing work that involves a pulling or pushing action from a step ladder, because if it suddenly gives, you can easily lose your balance and fall. If the work is too strenuous and injury could result, consider other options for performing the work.
- No one should be working under or near your ladder when you are working on it. If you happen to drop something, others can get hurt if nearby.
- When using a ladder near a door, take steps to avoid an accident. You can have a coworker guard the other side of the door, put a sign on the other side of the door, lock the door, or prop the door open.
- When on a ladder, do not “walk” it in order to move it. Take the time to descend, move it, and then ascend again.
- Step ladders should never be used in a horizontal position as platforms. They are designed for vertical use only.
- All co-workers must recognize that it is not “funny” to kick or shake a ladder when someone else is working on it. This is dangerous horseplay and there should be zero tolerance for it. Safety should be everyone’s concern.
- Safety in the workplace involves team effort. The unsafe use of step ladders can usually be more easily seen in others than in oneself. Hence, for everyone’s safety, if you see someone using a step ladder in an unsafe manner, kindly inform the worker. He/she may return the favor and save you injury at a later time.
- Using a step ladder as a wire rack, or something similar, is not a good idea, as the ladder can be pulled over and fall, potentially causing either damage to property or injury to people.
- When ascending a ladder into a finished ceiling space, as in a tiled ceiling, it is advisable to wear safety glasses as the space above the tiles usually has dust and other particles blowing around, and these could imbed in your eyes causing injury.
- When standing on a ladder, with your head in a dark ceiling space, take the time to get a portable light. You do not want to injure yourself on any sharp metal objects or exposed live electrical wires hanging out of a box or light fixture. (This has been observed.)
- When working from a ladder in a finished office space, it’s a good practice to place bright orange pylons a distance from your ladder, as office workers tend to be preoccupied with their own agenda, possibly reading while walking, texting, or otherwise distracted. They may not see your ladder until too late. The brightly colored pylons will help to alert them. For extra precaution, you can even “caution-tape” the area off.
- Do not leave tools on top of the ladder and walk away. Someone else may come along and, in picking up the ladder, the tools can fall and injure the person or others.

- Many workers like to have small boxes secured on top of the ladder for storing small material in, such as screws, nuts, or wire connectors. While this is handy, it could also result in a spill of the material all over the floor if the worker leaves the ladder, even temporarily, and someone else comes to pick the ladder up to move it. The material could then present a slip hazard if not picked up immediately.
- When descending a ladder, be cognizant of the last step. So many have misjudged this and due to a miss-step, have fallen and injured themselves.
- When closing a ladder, keep your fingers out of the way of the side arms. If your fingers get pinched, you will know it!
- When carrying a ladder, be watchful of the ceiling and any hanging light fixtures, exit lights or other signage. Damage can easily and quickly be caused if not careful.
- Also, when carrying a ladder and approaching a corner, ensure that the front of the ladder is held up, so as not to ram someone rounding the corner coming towards you.
- When a step ladder is used as a means of gaining access to an elevated platform, landing or similar-type area, the ladder must extend 3 feet (1 meter) above it. Also, when stepping onto a step ladder from this elevated location, avoid stepping onto the top step. The ladder can very easily tip sideways and fall over with you following it. It is also a good practice to have someone firmly hold the ladder from below as you descend or use a straight/extension ladder if available and can be utilized properly.
- Do not use step ladders to support work platforms of any kind.
- If a step ladder is too heavy or awkward to move around, get a co-worker to help. Be sure to return the favor when requested.
- When either ascending or descending a step ladder move one step at a time. Never double-step either up or down as it is too easy to slip or lose your balance.

SEE LADDER INSPECTION CHECKLIST

Lead

Purpose

This Program is intended to safeguard the Health of Guests, tenants, Contractors, and our Employees from Lead exposure in the workplace. ASM Global TCF Center will strive to maintain the highest standards in personnel health and safety. Lead poisoning is a major, preventable environmental health problem for both children and adults. In children, it may cause developmental problems, lower IQ, behavioral problems, language delay, anemia, damage to the nervous system and other problems. High lead levels in adults can cause high blood pressure, headaches, memory problems, kidney damage, irritability, difficulty sleeping, nerve disorders, muscle or joint pain and damage to the reproductive system. Public health problems related to lead poisoning results in billions of dollars in health care costs to taxpayers and the government. Although bans on leaded gasoline and paint have greatly reduced the incidence of dangerous lead levels in children, many children are still at risk for damaging lead exposure. Lead paint and the related dust and chips are the leading cause of high lead levels in U.S. children. ASM Global TCF Center is intending this program as a form of control of release or abatement of any material that any of the contents are identified as or contain lead.

Federal Guidelines on commercial properties are still under development and not completed. Last updated on Wednesday, February 29, 2012**, please see:** http://www.epa.gov/lead/pubs/regulation.htm **.**

2. Prevention

The goal is to identify all accessible areas in TCF Center that have Lead materials which are in a deteriorated condition. After identifying the areas, a determination will be made by the Engineering Manager and the DRCFA Capital Team as to the best approach toward limiting the possibility of exposure to lead materials. The options here are encapsulation, enclosure, or removal.

- Inaccessible areas or areas not likely to create exposure to the environment of the complex will be dealt with on an as needed basis, for example, during any construction work or demolition.
- Encapsulation will be used when necessary, primarily as a temporary measure to stop any leakage or exposure of Lead material.
- Enclosure methods will be used when appropriate, as determined by the supervisor of the AMP.

3. Scope

The term " renovation" is broadly defined as any activity that disturbs painted surfaces and covers all activities performed for compensation that disturb painted surfaces including plumbing, electrical work, window replacement, weatherization, and partial demolition of structures. ASM Global TCF **Center**'s regulation includes pre-renovation education requirements as well as training, licensure, and work practice requirements.

- ASM Global TCF **Center** will follow The State of Michigan guidelines laid out in the MIOSHA Lead Rules in General Industry (Rules 325.51901-325.51958).
- Any painting project requiring the removal of materials in the pre-1978 facilities must begin with testing for lead materials.
- Contractors who perform renovations in TCF Center are required to distribute a lead pamphlet to occupants before starting work.
- Contractors and other entities must be trained in the use of lead-safe work practices, and those lead-safe work practices must be followed to minimize occupants' exposure to lead hazards.

4. Definitions

- *Lead* means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds. *Lead Materials are used in many types of construction material or component containing Lead. Materials such as paint, pipe joint compounds, metal surface treatments,* lead-acid batteries.
- Lead Remediation Specialist, Individuals licensed through the State of Michigan in lead-based remediation techniques.

5. Examples of jobs at risk to lead exposure

Some of the workplace activities exposing people to lead include:

- Dry machine grinding, dicing, buffing, or cutting lead
- Manufacturing or recycling lead-acid batteries
- Repairs to radiators or vehicle exhaust systems
- Melting or casting lead or alloys containing lead e.g. lead trophies, yacht keels, leaded brass
- Removal of lead paint from surfaces by dry sanding, heat, or grit blasting
- Demolition involving oxycutting of structural steel primed with lead paint
- Fire assay involving lead

- Handling lead compounds causing lead dust e.g. from dry lead pigments, lead UV stabilizers
- Spray painting with lead paint (> 1% lead by dry weight).

6. Responsibilities

Managers / Supervisors

- Anticipate all work hazards and utilize all safeguards, as necessary.
- Ensure that all employees are properly trained, instructed in the safe practices and are aware of all hazards associated with exposure to Lead based materials.
- Initiate any necessary administrative action required to enforce safety practices.

Employees

- Follow ASM Global TCF **Center** safety policies/procedures and instructions of the responsible supervisor.
- Bring to the attention of the Senior Engineer on Duty or Engineering Manager any potentially hazardous situations such as discrepancies between instruction, procedures, and policies, faulty equipment, misapplication of device, improper practices, etc.
- Recognize that malfunctioning protection equipment must be repaired or replaced before use. The repair must be initiated as soon as possible after the malfunction is noted.

Environmental Health and Safety

- Provide technical assistance in defining hazardous operations, designating safe practices, and selecting proper devices.
- In coordination with Facilities Management and other supervisors, review and approve standard operating procedures upon request.
- Evaluate potential hazards during facility inspections to ensure compliance with existing policy and other safety guidelines.
- Support employees training relative to Lead safety.
- Develop and revise ASM Global TCF **Center**'s Lead safety policy periodically, or when regulatory changes occur.

Qualified Persons

- Comply with ASM Global TCF **Center**'s Lead safety policy safety program and take all required training.
- Be designated as the only people allowed to work on or near exposed electrical parts greater than 50 volts.
- Be designated as the only people who can test exposed electrical currents and equipment.
- Test suspected Lead based materials before commencement of work.

7. Procedures

All paint removal projects in facilities built predating 1978

- All painting tasks must be in compliance with the Michigan Lead based Paint Regulations.
- Begin all tasks were exposure to lead is possible by consulting with the Senior Engineering Manager and the DRCFA Capital Projects Team.
- A detailed plan of action must be laid out.
- Prior to removal of material, analysis through available Lead based Paint test kits or certified lab testing based on the type of material or debris before commencement of work.
- Consulting a Lead Remediation Specialists is **required for tasks where any material disturbed can become airborne.**

- Any remediation jobs will be undertaken by or sub-contracted to firms designated by the DRCFA Capital Projects Team. Specialists will be consulted as to a safety practice, instruction, and techniques.

TABLE 1

Jobs and Industries with Potential Lead Exposure

General Industry	
Lead production or smelting Brass, bronze, copper, or lead foundries Ammunition/explosives production Scrap metal handling Firing ranges Machining or grinding lead alloys Manufacture of radiation shielding Repair/replacement of refractory material in furnaces Ship building/repairing/breaking Mining	Battery manufacturing or recycling Automotive radiator repair Lead soldering Ceramic manufacturing Cable/wire stripping, splicing or production Rubber manufacturing Plastics manufacturing Leaded glass manufacturing Paint/pigment manufacturing
Construction	
Renovation, repair, or demolition of structures with lead paint Welding or torch-cutting painted metal Sandblasting, sanding, scraping, burning, or disturbing lead paint	Use or disturbance of lead solder, sheeting, flashing, or old electrical conduit Plumbing, particularly in older buildings

Lockout Tagout (LOTO)

1910.147 of OSHA regulations relates to the control of hazardous energy. TCF Center/ASM Global operations have developed this safety program for "Lock Out / Tag Out" preliminary procedures that acts as a lead into the site /operation specific procedure for our work force.

This portion of our program will address the basic concepts of the Lock Out/Tag Out program designed to safeguard and protect our employees and contractors who may be required to perform maintenance/ repair/ alterations to our equipment and /or systems. Contractors hired to perform repair/replacement or maintenance of our equipment and /or systems must review our program. If the Contractor has their own Lock Out / Tag Out Program, it must exceed our programs expectations.

The following pages will present the concept of an effective Lock Out / Tag Out Program, definitions of components of this program, and training specifications for this OSHA regulated program. It should be clearly

understood that each department within our organization may have a different process to follow in order to comply with this regulation. Some operations will be very simplistic, yet another operation may involve numerous steps to be followed, as well as more than one source of energy to be controlled by our staff. The Manager/Supervisor of the affected departments will be expected to insure that all employees authorized to perform lockout/tag out operations in their areas of responsibility have been trained on each piece of equipment /system under their job responsibility.

Scope and Purpose of this Program:

We will be improving our operations and productivity of equipment and systems that serve our organization and the users of our facilities. By implementing and following this program we will reduce and eliminate our work-related injuries for all departments participating in the repair/replacement/maintenance of our equipment and systems. Training sessions are twofold. A general training class format is presented to all affected/authorized employees and a site /shop specific training program must be conducted by the Manager /Supervisor of the affected department. This process will ensure that the employees are receiving the necessary information and instructions to enhance the safe work practices for every operation that they may come into contact with during their shift and tenure with our organization.

This program will be reviewed annually or any time we introduce new equipment or a new system to our operation. The change will be incorporated into this program in order to continue the well-being and safety of our employees.

All lock out/tag out materials must be company issued items. No employee shall utilize a personally owned lock/key to perform a lock out/ tag out procedure. Issuance of equipment will be recorded by each department participating in this program in order to maintain the integrity of the program and the track the authorized employees affected by this program.

MANAGEMENT OF LOCKOUT/TAGOUT PROGRAM

Identification of Equipment /Energy Sources:

Manager/Supervisor in each department must:

Perform an inspection/evaluation of all machinery/systems to determine the source of energy that may operate or flow through portions of said equipment. Determine how to eliminate each source of energy and the methods to do so select the mode of LO/TO that will protect the employee from injury

Documentation requirements:

Maintain job orders relating to LO/TO operations in their respective areas. Track training records of their employees

Retain signed distribution forms relating to LO/TO equipment for employees.

Equipment operational manual should be kept in files at the affected shop area. This manual will assist in determining the actual methods to eliminate the source of energy for equipment and / or system.

Department specific LO/TO operations manual. Must be available for review by all affected/authorized employees.

Supervisor role:

Review LO/TO operations with employees prior to specific task
Record the task to be performed and issue authorization to the employees scheduled to perform the job.
Be aware of all energy sources for each portion of the machinery/ system involved in the LO/TO operation.
Issue all required LO/TO equipment to employees authorized to perform this type of operation
Review the program of a Contractors operations if they are needed to perform a LO/TO operation in one of TCF Center's locations. Ensure the safety of our affected employees and our equipment/systems.

If the Contract Service does not have an active LO/TO program, they must follow our program and supply their workers with the equipment (locks/keys/tags/training) prior to performing the work they have been assigned to do for TCF Center. TCF Center personnel / affected employees must be notified of this Contract project prior to the commencement of the assigned work detail.

Supervisor for each Department:

Must review all evaluations of equipment/systems and verify that all energy sources have been identified for each piece of equipment and /or system. Types of Energy:

At TCF Center/ASM Global we may deal with the following types/forms of energy during a lock out/tag out procedure:
Electrical, Chemical, Hydraulic, Pneumatic, Gravity, Mechanical, Thermal, Plumbing, Compressed Air, Water, HVAC, Steam

We review all of our equipment/systems to determine which of the above listed sources of energy need to be isolated in order to perform our assigned task.

Energy Control Equipment:

Authorized employees are issued lock(s) and key(s) based on the need of each work environment. In some departments, one special lock and key for the lock out /tag out program will suffice. However, in some work environments it has been determined by our review and inspections of the equipment/ systems that multiple locks need to be issue to the authorized employees. Each lock for this employee must be keyed alike, so their one key will be able to open the locks they use for this program.

Each authorized employee will be issued a unique lock(s) and key for their use in lock out/tag out program.

Only the Engineering Manager's will have a master key. They are the only persons authorized and designated to override affixed lock out/ tag out equipment in the absence of the affected authorized employee.

TAG OUT process:

When there is no method of utilizing a lock out device on a piece of equipment / system, we must introduce a tag out system.

We will issue tags on a job by job situation, via the Supervisor under the direction of the Manager of the affected department. In this manner, we will always be alerted of the lack of a formal lock and key being utilized to isolate potential energy from a piece of equipment or a specific system.
Tags should be affixed to the affected equipment by means of a tie wrap. The tie wrap must be made of strong material and can only be removed by the authorized employee by cutting it off of the location. The tag must identify: the authorized employee by name/department, the date the tag out started and the process or equipment it is de-energizing. This should be laminated prior to being issued to the authorized employee for use in the tag out program.

Multi-lock hasp:
This should be used when there will be multiple authorized employees /departments working on a specific energy source. When more than one department participates in a lock out /tag out procedure, one authorized employee must be designated as the lead, by the overseeing department Supervisor. This designated authorized employee will affix their lock on the hasp first, the last person to remove their lock from this hasp, must return the hasp unit to the designated authorized employee. This process will ensure that all employees have completed their assigned tasks and are safely away from the affected area. The last lock off person returns the hasp to the designated authorized employee, concluding this project safely. At any time during the process of a lock out /tag out procedure, a question or concern develops in regard to the project, the Supervisor should be contacted for consultation and guidance.

Scenarios where the implementation of our Lock out/Tag out procedure will be put into effect may be as follows:

Repair /maintenance of an energized piece of equipment or system:
Employee has to enter an area that exposes them to energized/moving parts of a piece of equipment or system.
Safety guards have to be removed to service equipment.
Employee is required to place any part of their body in contact with the point of operation of the machine or the system.

BASIC STEPS OF LOCK OUT /TAG OUT:
Notify all affected employees that a lock out or tag out operation are going to be scheduled for a specific piece of equipment /system. If the affected piece of equipment / system is operating, it should be shut down using normal stopping procedure (depress stop button, open toggle switch, etc.) Utilize the controls on the equipment /system so the affected area is isolated from its energy source(s). Stored energy must be dissipated or restrained by methods of blocking, bleeding down or repositioning. Lock out or tag out the energy isolating devices with the authorized equipment issued by the company. (Lock/key or tags)

Make sure all affected employees have been cleared from the area, and then try to operate the equipment, making sure that the energy source has been eliminated.
(Remember to return the switch / control back to the off position) The equipment has been locked out or tagged out properly.

****** EOS — Equipment out of Service Lock out /Tag out ******
This portion of our LO/TO program is initiated by the formal approval of the Manager of the Engineering department.
There are currently two scenarios that would activate this portion of our program:
Shift change and work has to be continued:
Manager would authorize the use of the EOS equipment and issue the unit to the authorized employee ending his day. The authorized employee would then replace his LO device with the EOS device.
The oncoming authorized employee would then place his LO device on the equipment and remove the EOS equipment and return the EOS to the Manager in the shop area.
The second scenario would be when an affected piece of equipment /system has to be isolated for an extended period of time, but work has to be halted on service or repair. The Manager would issue this EOS device to the authorized employee and notify all authorized/affected employees of this extended EOS use and the equipment/system that is affected.
All information will be formally recorded into Smart maintenance for review and file purposes.

Restoring equipment or system to operating condition:
Once the repair/maintenance/adjustments have been made make sure areas is clear of any affected employees.
Remove all tools and equipment from the area of the affected equipment/system, guards have been reinstalled and employees are clear of the area, removes all lockout or tag out devices. Reenergize the equipment /system.
Multi person Lock out /Tag out procedure (where applicable):
If a hasp unit can be used, each person in the project must affix their own lock to the hasp unit. As they complete their task on the lock out /tag out operation they can remove their personal lock from the hasp unit.
The last person to remove their lock out device from the hasp unit must perform the required checks of the equipment/system for employee clearance/ tool clearance and then perform the reactivation of the power control source to the affected piece of equipment or system.
If the affected energy source cannot accommodate a multi lock hasp unit, then a lock out box or cabinet can be utilized to secure the one key that operates the single lock on the lock out point.
All other personnel would then affix their locks on the lock box cabinet to ensure the safety of all participants in this lock out /tag out procedure.
TCF Center/ASM Global lockout /tag out rule:
All equipment/systems must be locked out or tagged out to protect against accidental or inadvertent operation when the operation could cause injury to employees. Do not attempt to operate any switch, valve, or other energy isolating device when it is locked or tagged out.
Lockout/tag out terminology

Affected employee — worker(s) in the area of the lockout/tag out event is scheduled to occur. These employees are not authorized to perform the lockout/tag out, but they work with or around the affected equipment /system.
Authorized employee — worker who actually performs the lockout/tag out operation on an affected piece of equipment or system.
Energized- Machines and equipment are energized when (1) they are connected to an energy source or (2) they contain residual or stored energy.
Energy—isolating device- Any mechanical device that physically prevents the transmission or release of energy. These include, but are not limited to, manually operated electrical circuit breakers, disconnect switches, line valves, and blocks.
Energy source — Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.
Energy control procedure - A written document that contains those items of information an authorized employee needs to know in order to safely control hazardous energy during the servicing or maintenance of machines or equipment.
EOS Lock/Tag — Specific lock out device or tag out device utilized by authorization of the Manager to isolate energy during shift changes or extended isolation of energy time frames without actual work in process taking place.
Lockout- The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensures that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device- Any device that uses positive means such as a lock, either key or combination type, to hold an energy-isolating device in a safe position, thereby preventing the energizing of machinery or equipment. When properly installed, a blank flange or bolted slip blind are considered equivalent to lockout devices.
Tag out- The placement of a tag out 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 tag out device is removed.
Tag out device- Any prominent warning device, such as a tag and a means of attachment that can be securely fastened to an energy-isolating device in accordance with an established procedure. The tag indicates that the machine or equipment to which it is attached is not to be operated until the tag out device is removed in accordance with the energy control procedure.

General Rules –

All Extension Cords must have a grounding conductor

Exposed wiring in electrical cords with frayed insulation or visible deterioration must be replaced immediately

Flexible cords and / or cables must be free of splices and / or taps

Machine Guarding

Purpose

The Machine Guard Program at TCF Center is designed to protect Employees from hazards of moving machinery. All hazardous areas of a machine shall be guarded to prevent accidental "caught in" situations. References: *General Requirements for all Machines* (29 CFR 1910.212), *Woodworking Machinery* (29 CFR 1910.213), *Abrasive Wheels* (29 CFR 1910.215), *Power Presses* (29 CFR 1910.217), *Power Transmission* (29 CFR 1910.219).

Responsibilities

Management

- Ensure all machinery is properly guarded
- Provide training to employees on machine guard rules
- Ensure new purchased equipment meets the machine guard requirements prior to use

Supervisors

- Train assigned employees on the specific machine guard rules in their areas
- Monitor and inspect to ensure machine guards remain in place and functional
- Immediately correct machine guard deficiencies

Employees

- Do not remove machine guards unless equipment if locked and tagged
- Replace machine guards properly
- Report machine guard problems to supervisors immediately
- Do not operate equipment unless guards are in place and functional
- Only trained and authorized employees may remove machine guards

Definition of Terms

Guards: Barriers that prevent Employees from contact with moving portions or parts of exposed machinery or equipment which could cause physical harm to the Employees.

Enclosures: Mounted physical barriers which prevent access to moving parts of machinery or equipment.

Point-of-Operation: The area on a machine or item of equipment, where work is being done and material is positioned for processing or change by the machine.

Power Transmission: Any mechanical parts which transmit energy and motion from a power source to the point-of-operation. Example: Gear and chain drives, cams, shafts, belt and pulley drives and rods. NOTE: Components which are (7) feet or less from the floor or working platform shall be guarded.

Nip Points: In-Running Machine or equipment parts, which rotate towards each other, or where one part rotates toward stationery object.

Shear points: The reciprocal (back and forth) movement of a mechanical part past a fixed point on a machine.

Rotating Motions: Exposed mechanisms are dangerous unless guarded. Even a smooth, slowly rotating shaft or coupling can grasp clothing or hair upon contact with the skin and force an arm or hand into a dangerous position. Affixed or hinged guard enclosure protects against this exposure.

Reciprocating: Reciprocating motions are produced by the back and forth movements of certain machine or equipment parts. This motion is hazardous, when exposed, offering pinch or shear points to an Employee. A fixed enclosure such as a barrier guard is an effective method against this exposure.

Transverse Motions: Transverse motions are hazardous due to straight line action and in-running nip points. Pinch and shear points also are created with exposed machinery and equipment parts operating between a fixed or other moving object. A fixed or hinged guard enclosure provides protection against this exposure.

Cutting Actions: Cutting action results when rotating, reciprocating, or transverse motion is imparted to a tool so that material being removed is in the form of chips. Exposed points of operation must be guarded to protect the operator from contact with cutting hazards, being caught between the operating parts and from flying particles and sparks.

Shearing Action: The danger of this type of action lies at the point of operation where materials are actually inserted, maintained, and withdrawn. Guarding is accomplished through fixed barriers, interlocks, remote control placement (2 hand controls), feeding or ejection.

Hazards - use of machinery or equipment with inadequate guards or damaged controls can result in:

- Amputation
- Skin Burns
- Cuts & fractures
- Death

Hazard Controls - controls used to prevent exposure to moving or energized machine parts includes:

- Machine guards
- Interlocks
- Presence sensing devices
- Gates
- Two-hand controls
- Employee training

Machine Guarding Requirements

- Guards shall be affixed to the machine where possible and secured.
- A guard shall not offer an accident hazard in itself.
- The point-of-operation of machines whose operation exposes an Employee to injury shall be guarded.
- Revolving drums, barrels and containers shall be guarded by an enclosure which is interlocked with the drive mechanism.
- When periphery of fan blades are less than 7 feet above the floor or working level, the blades shall be guarded with a guard having openings no larger than 1/2 inch.
- Machines designed for a fixed location shall be securely anchored to prevent walking or moving. For example, Drill Presses, Bench Grinders, etc.

General Requirements for Machine Guards

1. Guards must prevent hands, arms, or any part of an Employees body from making contact with hazardous moving parts. A good safeguarding system eliminates the possibility of the operator or other Employees from placing parts of their bodies near hazardous moving parts.

2. Employees should not be able to easily remove or tamper with guards. Guards and safety devices should be made of durable material that will withstand the conditions of normal use and must be firmly secured to the machine.
3. Guard should ensure that no objects can fall into moving parts. An example would be a small tool which is dropped into a cycling machine could easily become a projectile that could and injure others.
4. Guard edges should be rolled or bolted in such a way to eliminate sharp or jagged edges.
5. Guard should not create interference which would hamper Employees from performing their assigned tasks quickly and comfortably.
6. Lubrication points and feeds should be placed outside the guarded area to eliminate the need for guard removal.

Training

All Employees shall be provided training in the hazards of machines and the importance of proper machine guards. Machine safety and machine guarding rules will be thoroughly explained as part of the new hire orientation program and annually as refresher safety training.

Tool Safety Program

Purpose

Use of tools makes many tasks easier. However, the same tools that assist us, if improperly used or maintained, can create significant hazards in our work areas. Employees who use tools must be properly trained to use, adjust, store, and maintain tools properly. This program covers hand, electrical, pneumatic, powder driven, and hydraulic tool safety.

Responsibility

Management

* Provide correct tools for assigned tasks
* Ensure tools are maintained and stored safely
* Provide employee training
* Provide for equipment repair

Employees

* Follow proper tool safety guidelines
* Report tool deficiencies and malfunctions
* Properly store tools when work is completed

Hazard Control

Engineering

* Properly designed tools
* Guards & safety devices

Administrative

* Tool sharpening program

* Use of PPE
* Control of tool issue
* Employee Training
* Controlled access to equipment and tool areas

General Safety Precautions

Employees who use hand and power tools and who are exposed to the hazards of falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases must be provided with the particular personal equipment necessary to protect them from the hazard.

All hazards involved in the use of tools can be prevented by following five basic safety rules:

* Keep all tools in good condition with regular maintenance.
* Use the right tool for the job.
* Examine each tool for damage before use.
* Operate according to the manufacturer's instructions.
* Provide and use the proper protective equipment.

Hand Tools

Hand tools are non-powered. They include anything from axes to wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance.

Some examples:

* Using a screwdriver as a chisel may cause the tip of the screwdriver to break and fly, hitting the user or other employees.
* If a wooden handle on a tool such as a hammer or an axe is loose, splintered, or cracked, the head of the tool may fly off and strike the user or another worker.
* A wrench must not be used if its jaws are sprung, because it might slip.
* Impact tools such as chisels, wedges, or drift pins are unsafe if they have mushroomed heads. The heads might shatter on impact, sending sharp fragments flying.

Appropriate personal protective equipment, e.g., safety goggles, gloves, etc., should be worn due to hazards that may be encountered while using portable power tools and hand tools.

Floors shall be kept as clean and dry as possible to prevent accidental slips with or around dangerous hand tools.

Around flammable substances, sparks produced by iron and steel hand tools can be a dangerous ignition source. Where this hazard exists, spark-resistant tools made from brass, plastic, aluminum, or wood will provide for safety.

Power Tool Precautions

Power tools can be hazardous when improperly used. There are several types of power tools, based on the power source they use: electric, pneumatic, liquid fuel, hydraulic, and powder actuated.

The following general precautions should be observed by power tool users:

* Never carry a tool by the cord or hose.
* Never yank the cord or the hose to disconnect it from the receptacle.
* Keep cords and hoses away from heat, oil, and sharp edges.
* Disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits, and cutters.
* All observers should be kept at a safe distance away from the work area.

* Secure work with clamps or a vise, freeing both hands to operate the tool.
* Avoid accidental starting. The worker should not hold a finger on the switch button while carrying a plugged-in tool.
* Tools should be maintained with care. They should be kept sharp and clean for the best performance. Follow instructions in the user's manual for lubricating and changing accessories.
* Be sure to keep good footing and maintain good balance.
* The proper apparel should be worn. Loose clothing, ties, or jewelry can become caught in moving parts.
* All portable electric tools that are damaged shall be removed from use and tagged "Do Not Use."

Guards

Hazardous moving parts of a power tool need to be safeguarded. For example, belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or moving parts of equipment must be guarded.

Guards, as necessary, should be provided to protect the operator and others from the following:

* point of operation,
* in-running nip points,
* rotating parts, and
* flying chips and sparks.

Safety guards must never be removed when a tool is being used. For example, portable circular saws must be equipped with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except when it makes contact with the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work.

Safety Switches

The following hand-held powered tools are to be equipped with a momentary contact "on-off" control switch: drills, tappers, fastener drivers, horizontal, vertical and angle grinders with wheels larger than 2 inches in diameter, disc and belt sanders, reciprocating saws, saber saws, and other similar tools. These tools also may be equipped with a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

The following hand-held powered tools may be equipped with only a positive "on-off" control switch: platen sanders, disc sanders with discs 2 inches or less in diameter; grinders with wheels 2 inches or less in diameter; routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks ¼-inch wide or less.

Other hand-held powered tools such as circular saws having a blade diameter greater than 2 inches, chain saws, and percussion tools without positive accessory holding means must be equipped with a constant pressure switch that will shut off the power when the pressure is released.

Electrical Safety

Among the chief hazards of electric-powered tools are burns and slight shocks which can lead to injuries or even heart failure. Under certain conditions, even a small amount of current can result in severe injury and eventual death. A shock also can cause the user to fall off a ladder or other elevated work surface.

To protect the user from shock, tools must either have a three-wire cord with ground or be grounded, be double insulated, or be powered by a low-voltage isolation transformer. Three-wire cords contain two current-carrying conductors and a grounding conductor. One end of the grounding conductor connects to the tool's metal housing. The other end is grounded through a prong on the plug. Anytime an adapter is

used to accommodate a two-hole receptacle, the adapter wire must be attached to a known ground. The third prong should never be removed from the plug.

Double insulation is more convenient. The user and the tools are protected in two ways: by normal insulation on the wires inside, and by a housing that cannot conduct electricity to the operator in the event of a malfunction.

Electric Power Tool General Safety Practices:

* Electric tools should be operated within their design limitations.
* Gloves and safety footwear are recommended during use of electric tools.
* When not in use, tools should be stored in a dry place.
* Electric tools should not be used in damp or wet locations.
* Work areas should be well lighted.

Powered Abrasive Wheel Tools

Powered abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments.

Before an abrasive wheel is mounted, it should be inspected closely and sound- or ring-tested to be sure that it is free from cracks or defects. To test, wheels should be tapped gently with a light non-metallic instrument. If they sound cracked or dead, they could fly apart in operation and so must not be used. A sound and undamaged wheel will give a clear metallic tone or "ring."

To prevent the wheel from cracking, the user should be sure it fits freely on the spindle. The spindle nut must be tightened enough to hold the wheel in place, without distorting the flange. Follow the manufacturer's recommendations. Care must be taken to assure that the spindle wheel will not exceed the abrasive wheel specifications.

Due to the possibility of a wheel disintegrating (exploding) during start-up, the employee should never stand directly in front of the wheel as it accelerates to full operating speed.

Portable grinding tools need to be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of breakage.

Powered Grinder Safety Precautions

* Always use eye protection.
* Turn off the power when not in use.
* Never clamp a hand-held grinder in a vise.

Pneumatic Tools

Pneumatic tools are powered by compressed air and include chippers, drills, hammers, and sanders. There are several dangers encountered in the use of pneumatic tools. The main one is the danger of getting hit by one of the tool's attachments or by some kind of fastener the worker is using with the tool. Eye protection is required, and face protection is recommended for employees working with pneumatic tools. Working with noisy tools such as jackhammers requires proper, effective use of hearing protection.

When using pneumatic tools, employees are to check to see that they are fastened securely to the hose to prevent them from becoming disconnected. A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard.

A safety clip or retainer must be installed to prevent attachments, such as chisels on a chipping hammer, from being unintentionally shot from the barrel.

Screens must be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers, or air drills.

Compressed air guns should never be pointed toward anyone. Users should never "dead-end" it against themselves or anyone else.

Powder-Actuated Tools

Powder-actuated tools operate like a loaded gun and should be treated with the same respect and precautions. In fact, they are so dangerous that they must be operated only by specially trained employees.

Powder-Actuated Tool Safety:

* These tools should not be used in an explosive or flammable atmosphere.
* Before using the tool, the worker should inspect it to determine that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.
* The tool should never be pointed at anybody.
* The tool should not be loaded unless it is to be used immediately. A loaded tool should not be left unattended, especially where it would be available to unauthorized persons.
* Hands should be kept clear of the barrel end. To prevent the tool from firing accidentally, two separate motions are required for firing: one to bring the tool into position, and another to pull the trigger. The tools must not be able to operate until they are pressed against the work surface with a force of at least 5 pounds greater than the total weight of the tool.

If a powder-actuated tool misfires, the employee should wait at least 30 seconds, and then try firing it again. If it still will not fire, the user should wait another 30 seconds so that the faulty cartridge is less likely to explode, than carefully remove the load. The bad cartridge should be put in water.

Suitable eye and face protection are essential when using a powder-actuated tool.

The muzzle end of the tool must have a protective shield or guard centered perpendicularly on the barrel to confine any flying fragments or particles that might otherwise create a hazard when the tool is fired. The tool must be designed so that it will not fire unless it has this kind of safety device.

All powder-actuated tools must be designed for varying powder charges so that the user can select a powder level necessary to do the work without excessive force.

If the tool develops a defect during use it should be tagged and taken out of service immediately until it is properly repaired.

Powder-Actuated Tool Fasteners

When using powder-actuated tools to apply fasteners, there are some precautions to consider. Fasteners must not be fired into material that would let them pass through to the other side. The fastener must not be driven into materials like brick or concrete any closer than 3 inches to an edge or corner. In steel, the fastener must not come any closer than one-half inch from a corner or edge. Fasteners must not be driven into very hard or brittle materials which might chip or splatter or make the fastener ricochet.

An alignment guide must be used when shooting a fastener into an existing hole. A fastener must not be driven into a spalled area caused by an unsatisfactory fastening.

Hydraulic Power Tools

The fluid used in hydraulic power tools must be an approved fire-resistant fluid and must retain its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings must not be exceeded.

Jacks

All jacks - lever and ratchet jacks, screw jacks, and hydraulic jacks - must have a device that stops them from jacking up too high. Also, the manufacturer's load limit must be permanently marked in a prominent place on the jack and should not be exceeded.

A jack should never be used to support a lifted load. Once the load has been lifted, it must immediately be blocked up.

Use wooden blocking under the base if necessary, to make the jack level and secure. If the lift surface is metal, place a 1-inch-thick hardwood block or equivalent between it and the metal jack head to reduce the danger of slippage.

To set up a jack, make certain of the following:

* the base rests on a firm level surface,
* the jack is correctly centered,
* the jack head bears against a level surface, and
* the lift force is applied evenly.

Proper maintenance of jacks is essential for safety. All jacks must be inspected before each use and lubricated regularly. If a jack is subjected to an abnormal load or shock, it should be thoroughly examined to make sure it has not been damaged.

Hydraulic jacks exposed to freezing temperatures must be filled with adequate antifreeze liquid.

Mold

Prevention

Moisture control is the key to mold control. When water leaks or spills occur indoors - act promptly. Any initial water infiltration should be stopped and cleaned promptly. A prompt response (within 24-48 hours) and thorough clean- up, drying, and/or removal of water-damaged materials will prevent or limit mold growth.

Mold prevention tips include:

- Repairing plumbing leaks and leaks in the building structure as soon as possible.
- Looking for condensation and wet spots. Fix source(s) of moisture incursion problem(s) as soon as possible.
- Preventing moisture from condensing by increasing surface temperature or reducing the moisture level in the air (humidity). To increase surface temperature, insulate or increase air circulation. To reduce the moisture level in the air, repair leaks, increase ventilation (if outside air is cold and dry), or dehumidify (if outdoor air is warm and humid).
- Keeping HVAC drip pans clean, flowing properly, and unobstructed.
- Performing regularly scheduled building/ HVAC inspections and maintenance, including filter changes.
- Maintaining indoor relative humidity below 70% (25 - 60%, if possible).

- Venting moisture-generating appliances, such as dryers, to the outside where possible.
- Venting kitchens (cooking areas) and bathrooms according to local code requirements.
- Cleaning and drying wet or damp spots as soon as possible, but no more than 48 hours after discovery.
- Providing adequate drainage around buildings and sloping the ground away from building foundations. Follow all local building codes.
- Pinpointing areas where leaks have occurred, identifying the causes, and taking preventive action to ensure that they do not reoccur.

Questions That May Assist in Determining Whether a Mold Problem Currently Exists

- Are building materials or furnishings visibly moisture damaged?
- Have building materials been wet more than 48 hours?
- Are there existing moisture problems in the building?
- Are building occupants reporting musty or moldy odors?
- Are building occupants reporting health problems that they think are related to mold in the indoor environment?
- Has the building been recently remodeled or has the building use changed?
- Has routine maintenance been delayed, or the maintenance plan been altered?

Always consider consulting a health professional to address any employee health concerns.

Remediation Plan

Remediation includes both the identification and correction of the conditions that permit mold growth, as well as the steps to safely and effectively remove mold damaged materials.

Before planning the remediation assess the extent of the mold or moisture problem and the type of damaged materials. If you choose to hire outside assistance to do the cleanup, make sure the contractor has experience with mold remediation. Check references and ask the contractor to follow the recommendations in EPA's publication, "Mold Remediation in Schools and Commercial Buildings," or other guidelines developed by professional or governmental organizations.

The remediation plan should include steps to permanently correct the water or moisture problem. The plan should cover the use of appropriate personal protective equipment (PPE). It also should include steps to carefully contain and remove moldy building materials in a manner that will prevent further contamination. Remediation plans may vary greatly depending on the size and complexity of the job and may require revision if circumstances change or new facts are discovered.

If you suspect that the HVAC system is contaminated with mold, or if mold is present near the intake to the system, contact the National Air Duct Cleaners Association (NADCA), or consult EPA's guide, "Should You Have the Air Ducts in Your Home Cleaned?" before taking further action. Do not run the HVAC system if you know or suspect that it is contaminated with mold, as it could spread contamination throughout the building. If the water or mold damage was caused by sewage or other contaminated water, consult a professional who has experience cleaning and repairing buildings damaged by contaminated water.

The remediation manager's highest priority must be to protect the health and safety of the building occupants

and remediators. Remediators should avoid exposing themselves and others to mold-laden dusts as they conduct their cleanup activities. Caution should be used to prevent mold and mold spores from being dispersed throughout the air where they can be inhaled by building occupants. In some cases, especially those involving large areas of contamination, the remediation plan may include temporary relocation of some or all of the building occupants.

When deciding if relocating occupants is necessary, consideration should be given to the size and type of mold growth, the type and extent of health effects reported by the occupants, the potential health risks that could be associated with the remediation activity, and the amount of disruption this activity is likely to cause. In addition, before deciding to relocate occupants, one should also evaluate the remediator's ability to contain/minimize possible aerosolization of mold spores given their expertise and the physical parameters of the workspace. When possible, remediation activities should be scheduled during off hours when building occupants are less likely to be affected.

Remediators, particularly those with health-related concerns, may wish to check with their physicians or other health-care professionals before working on mold remediation or investigating potentially moldy areas. If any individual has health concerns, doubts, or questions before beginning a remediation/cleanup project, he or she should consult a health professional.

Mold Remediation/Cleanup Methods

The purpose of mold remediation is to correct the moisture problem and to remove moldy and contaminated materials to prevent human exposure and further damage to building materials and furnishings. Porous materials that are wet and have mold growing on them may have to be discarded because molds can infiltrate porous substances and grow on or fill in empty spaces or crevices. This mold can be difficult or impossible to remove completely.

As a general rule, simply killing the mold, for example, with biocide is not enough. The mold must be removed, since the chemicals and proteins, which can cause a reaction in humans, are present even in dead mold.

A variety of cleanup methods are available for remediating damage to building materials and furnishings caused by moisture control problems and mold growth. The specific method or group of methods used will depend on the type of material affected. Some methods that may be used include the following:

Wet Vacuum

Wet vacuums are vacuum cleaners designed to collect water. They can be used to remove water from floors, carpets, and hard surfaces where water has accumulated. They should not be used to vacuum porous materials, such as gypsum board. Wet vacuums should be used only on wet materials, as spores may be exhausted into the indoor environment if insufficient liquid is present. The tanks, hoses, and attachments of these vacuums should be thoroughly cleaned and dried after use since mold and mold spores may adhere to equipment surfaces.

Damp Wipe

Mold can generally be removed from nonporous surfaces by wiping or scrubbing with water and detergent. It is important to dry these surfaces quickly and thoroughly to discourage further mold growth. Instructions for cleaning surfaces, as listed on product labels, should always be read, and followed.
HEPA Vacuum

HEPA (High-Efficiency Particulate Air) vacuums are recommended for final cleanup of remediation areas after materials have been thoroughly dried and contaminated materials removed. HEPA vacuums also are recommended for cleanup of dust that may have settled on surfaces outside the remediation area. Care must be taken to assure that the filter is properly seated in the vacuum so that all the air passes through the filter. When changing the vacuum filter, remediators should wear respirators, appropriate personal protective clothing, gloves, and eye protection to prevent exposure to any captured mold and other contaminants. The filter and contents of the HEPA vacuum must be disposed of in impermeable bags or containers in such a way as to prevent release of the debris.

Disposal of Damaged Materials

Building materials and furnishings contaminated with mold growth that are not salvageable should be placed in sealed impermeable bags or closed containers while in the remediation area. These materials can usually be discarded as ordinary construction waste. It is important to package mold-contaminated materials in this fashion to minimize the dispersion of mold spores. Large items with heavy mold growth should be covered with polyethylene sheeting and sealed with duct tape before being removed from the remediation area. Some jobs may require the use of dust-tight chutes to move large quantities of debris to a dumpster strategically placed outside a window in the remediation area.

Use of Biocides

The use of a biocide, such as chlorine bleach, is not recommended as a routine practice during mold remediation, although there may be instances where professional judgment may indicate its use (for example, when immuno-compromised individuals are present). In most cases, it is not possible or desirable to sterilize an area, as a background level of mold spores comparable to the level in outside air will persist. However, the spores in the ambient air will not cause further problems if the moisture level in the building has been corrected.

Biocides are toxic to animals and humans, as well as to mold. If you choose to use disinfectants or biocides, always ventilate the area, using outside air if possible, and exhaust the air to the outdoors. When using fans, take care not to extend the zone of contamination by distributing mold spores to a previously unaffected area. Never mix chlorine bleach solution with other cleaning solutions or detergents that contain ammonia because this may produce highly toxic vapors and create a hazard to workers.

Some biocides are considered pesticides, and some states require that only registered pesticide applicators apply these products in schools, commercial buildings, and homes. Make sure anyone applying a biocide is properly licensed where required.

Fungicides are commonly applied to outdoor plants, soil, and grains as a powder or spray. Examples of fungicides include hexachlorobenzene, organomercurials, pentachlorophenol, phthalimides, and dithiocarbamates.

Do not use fungicides developed for outdoor use in any indoor application, as they can be extremely toxic to animals and humans in an enclosed environment.

When you use biocides as a disinfectant or a pesticide, or as a fungicide, you should use appropriate PPE, including respirators. Always, read and follow product label precautions. It is a violation of Federal (EPA) law to use a biocide in any manner inconsistent with its label direction.

Mold Remediation Guidelines

This section presents remediation guidelines for building materials that have or are likely to have mold growth. The guidelines are designed to protect the health of cleanup personnel and other workers during remediation. These guidelines are based on the size of the area impacted by mold contamination. Please note that these are guidelines; some professionals may prefer other remediation methods, and certain circumstances may require different approaches or variations on the approaches described below. If possible, remediation activities should be scheduled during off-hours when building occupants are less likely to be affected.

Although the level of personal protection suggested in these guidelines is based on the total surface area contaminated and the potential for remediator or occupant exposure, professional judgment always should play a part in remediation decisions. These remediation guidelines are based on the size of the affected area to make it easier for remediators to select appropriate techniques, not on the basis of research showing there is a specific method appropriate at a certain number of square feet. The guidelines have been designed to help construct a remediation plan. The remediation manager should rely on professional judgment and experience to adapt the guidelines to particular situations. When in doubt, caution is advised. Consult an experienced mold remediator for more information.

Level I: Small Isolated Areas (10 sq. ft or less) - e.g., ceiling tiles, small areas on walls.

- Remediation can be conducted by the regular building maintenance staff as long as they are trained on proper clean-up methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

- Respiratory protection (e.g., N-95 disposable respirator) is recommended. Respirators must be used in accordance with the OSHA respiratory protection standard (29 CFR 1910.134). Gloves and eye protection should be worn.

- The work area should be unoccupied. Removing people from spaces adjacent to the work area is not necessary, but is recommended for infants (less than 12 months old), persons recovering from recent surgery, immune-suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).

- Containment of the work area is not necessary. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.

- Contaminated materials that cannot be cleaned should be removed from the building in a sealed impermeable plastic bag. These materials may be disposed of as ordinary waste.

- The work area and areas used by remediation workers for egress should be cleaned with a damp cloth or mop and a detergent solution.

- All areas should be left dry and visibly free from contamination and debris.

Level II: Mid-Sized Isolated Areas (10-30 sq. ft.) – e.g., individual wallboard panels.

- Remediation can be conducted by the regular building maintenance staff. Such persons should receive training on proper clean-up methods, personal protection, and potential health hazards. This training can be performed as part of a program to comply with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

- Respiratory protection (e.g., N-95 disposable respirator) is recommended. Respirators must be used in accordance with the OSHA respiratory protection standard (29 CFR 1910.134). Gloves and eye protection should be worn.

- The work area should be unoccupied. Removing people from spaces adjacent to the work area is not necessary, but is recommended for infants (less than 12 months old), persons recovering from recent surgery, immune-suppressed people, or people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).

- Surfaces in the work area that could become contaminated should be covered with a secured plastic sheet(s) before remediation to contain dust/debris and prevent further contamination

  . Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are recommended.

- Contaminated materials that cannot be cleaned should be removed from the building in a sealed impermeable plastic bag. These materials may be disposed of as ordinary waste.

- The work area and areas used by remediation workers for egress should be HEPA vacuumed and cleaned with a damp cloth or mop and a detergent solution.

- All areas should be left dry and visibly free from contamination and debris.

Level III: Large Isolated Areas (30 –100 square feet) – e.g., several wallboard panels.

Industrial hygienists or other environmental health and safety professionals with experience performing microbial investigations and/or mold remediation should be consulted prior to remediation activities to provide oversight for the project.

The following procedures may be implemented depending upon the severity of the contamination:

- It is recommended that personnel be trained in the handling of hazardous materials and equipped with respiratory protection (e.g., N-95 disposable respirator). Respirators must be used in accordance with the OSHA respiratory protection standard (29 CFR 1910.134). Gloves and eye protection should be worn.

- Surfaces in the work area and areas directly adjacent that could become decontaminated should be covered with a secured plastic sheet(s) before remediation to contain dust/ debris and prevent further contamination.

- Seal ventilation ducts/grills in the work area and areas directly adjacent with plastic sheeting.

- The work area and areas directly adjacent should be unoccupied. Removing people from spaces near the work area is recommended for infants, persons having undergone recent surgery, immune-suppressed people, or people with chronic inflammatory lung diseases. (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).

- Dust suppression methods, such as misting (not soaking) surfaces prior to mediation, are recommended.

- Contaminated materials that cannot be cleaned should be removed from the building in sealed impermeable plastic bags. These materials may be disposed of as ordinary waste.

- The work area and surrounding areas should be HEPA vacuumed and cleaned with a damp cloth or mop and a detergent solution.

- All areas should be left dry and visibly free from contamination and debris.

Note: If abatement procedures are expected to generate a lot of dust (e.g., abrasive cleaning of contaminated surfaces, demolition of plaster walls) or the visible concentration of the mold is heavy (blanket coverage as opposed to patchy), it is recommended that the remediation procedures for Level IV be followed.

Level IV: Extensive Contamination (greater than 100 contiguous square feet in an area).

Industrial hygienists or other environmental health and safety professionals with experience performing microbial investigations and/or mold remediation should be consulted prior to remediation activities to provide oversight for the project.

The following procedures may be implemented depending upon the severity of the contamination:

- Personnel trained in the handling of hazardous materials and equipped with:
    - Full face piece respirators with HEPA cartridges.
    - Disposable protective clothing covering entire body including both head and shoes; and
    - Gloves.
- Containment of the affected area:
    - Complete isolation of work area from occupied spaces using plastic sheeting sealed with duct tape (including ventilation ducts/grills, fixtures, and other openings).
    - The use of an exhaust fan with a HEPA filter to generate negative pressurization; and
    - Airlocks and decontamination room.
- If contaminant practices effectively prevent mold from migrating from affected areas, it may not be necessary to remove people from surrounding work areas. However, removal is still recommended for infants, persons having undergone recent surgery, immune- suppressed people, or people with chronic inflammatory lung diseases. (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).

- Contaminated materials that cannot be cleaned should be removed from the building in sealed impermeable plastic bags. The outside of the bags should be cleaned with a damp cloth and a detergent solution or HEPA vacuumed in the decontamination chamber prior to their transport to uncontaminated

areas of the building. These materials may be disposed of as ordinary waste.

- The contained area and decontamination room should be HEPA vacuumed and cleaned with a damp cloth or mopped with a detergent solution and be visibly clean prior to the removal of isolation barriers.

Personal Protective Equipment (PPE)

Any remediation work that disturbs mold and causes mold spores to become airborne increases the degree of respiratory exposure. Actions that tend to disperse mold include: breaking apart moldy porous materials such as wallboard; destructive invasive procedures to examine or remediate mold growth in a wall cavity; removal of contaminated wallpaper by stripping or peeling; using fans to dry items or ventilate areas.

The primary function of personal protective equipment is to prevent the inhalation and ingestion of mold and mold spores and to avoid mold contact with the skin or eyes. The following sections discuss the various types of PPE that may be used during remediation activities.

Skin and Eye Protection

Gloves protect the skin from contact with mold, as well as from potentially irritating cleaning solutions. Long gloves that extend to the middle of the forearm are recommended. The glove material should be selected based on the type of substance/ chemical being handled. If you are using a biocide such as chlorine bleach, or a strong cleaning solution, you should select gloves made from natural rubber, neoprene, nitrile, polyurethane, or PVC. If you are using a mild detergent or plain water, ordinary household rubber gloves may be used.

To protect your eyes, use properly fitted goggles or a full-face piece respirator. Goggles must be designed to prevent the entry of dust and small particles. Safety glasses or goggles with open vent holes are not appropriate in mold remediation.

Respiratory Protection

Respirators protect cleanup workers from inhaling airborne mold, contaminated dust, and other particulates that are released during the remediation process. Either a half mask or full-face piece air-purifying respirator can be used. A full-face piece respirator provides both respiratory and eye protection. Please refer to the discussion of the different levels of remediation to ascertain the type of respiratory protection recommended. Respirators used to provide protection from mold and mold spores must be certified by the National Institute for Occupational Safety and Health (NIOSH). More protective respirators may have to be selected and used if toxic contaminants such as asbestos or lead are encountered during remediation.

As specified by OSHA in 29 CFR 1910.134 individuals who use respirators must be properly trained, have medical clearance, and be properly fit tested before they begin using a respirator. In addition, use of respirators requires the employer to develop and implement a written respiratory protection program, with worksite-specific procedures and elements.

Protective Clothing

While conducting building inspections and remediation work, individuals may encounter hazardous biological

agents as well as chemical and physical hazards. Consequently, appropriate personal protective clothing (i.e., reusable or disposable) is recommended to minimize cross-contamination between work areas and clean areas, to prevent the transfer and spread of mold and other contaminants to street clothing, and to eliminate skin contact with mold and potential chemical exposures.

Disposable PPE should be discarded after it is used. They should be placed into impermeable bags, and usually can be discarded as ordinary construction waste. Appropriate precautions and protective equipment for biocide applicators should be selected based on the product manufacturer's warnings and recommendations (e.g., goggles or face shield, aprons or other protective clothing, gloves, and respiratory protection).

Sampling for Mold

Is it necessary to sample for mold? In most cases, if visible mold growth is present, sampling is unnecessary. Air sampling for mold may not be part of a routine assessment because decisions about appropriate remediation strategies often can be made on the basis of a visual inspection.

Your first step should be to inspect for any evidence of water damage and visible mold growth. Testing for mold is expensive, and there should be a clear reason for doing so. In many cases, it is not economically practical or useful to test for mold growth on surfaces or for airborne spores in the building. In addition, there are no standards for "acceptable" levels of mold in buildings, and the lack of a definitive correlation between exposure levels and health effects makes interpreting the data difficult, if not impossible.

Testing is usually done to compare the levels and types of mold spores found inside the building with those found outside of the building or for comparison with another location in the building. In addition, air sampling may provide tangible evidence supporting a hypothesis that investigators have formulated. For example, air sampling may show a higher concentration of the same species of mold when the HVAC is operating than when it has been turned off. This finding may convince the investigators that the mold is growing within, and being disseminated by, the HVAC system. Conversely, negative results may persuade investigators to abandon this hypothesis and to consider other sources of mold growth or dissemination. If you know you have a mold problem, it is more important to spend time and resources removing the mold and solving the moisture problem that causes the moldy conditions than to undertake extensive testing for the type and quantity of mold.

If you are in doubt about sampling, consult an industrial hygienist or other environmental health or safety professional with experience in microbial investigations to help you decide if sampling for mold is necessary or useful, and to identify persons who can conduct any necessary sampling. Due to the wide difference in individual susceptibility to mold contamination, sampling results sampling may have limited application. However, sampling results can be used as a guide to determine the extent of an infestation and the effectiveness of the cleanup. Their interpretation is best left to the industrial hygienist or other environmental health or safety professional.

Sampling for mold should be conducted by professionals with specific experience in designing mold-sampling protocols, sampling methods for microbial contaminants, and interpretation of results. For additional information on air sampling, refer to the American Conference of Governmental Industrial Hygienists' document, "Bio aerosols: Assessment and Control." In addition, sampling and analysis should follow any other methods recommended by either OSHA, NIOSH, EPA, the American Industrial Hygiene Association, or other recognized professional guidelines. Types of samples can include air samples, surface samples, bulk samples, and water samples from condensate drain pans or cooling towers.

Microscopic identification of the spores/ colonies requires considerable expertise. These services are not

routinely available from commercial laboratories. Documented quality control in the laboratories used for analysis of the bulk, surface, and other air samples is necessary. The American Industrial Hygiene Association offers accreditation to microbial laboratories (Environmental Microbiology Laboratory Accreditation Program (EMLAP)). Accredited laboratories must participate in quarterly proficiency testing (Environmental Microbiology Proficiency Analytical Testing Program (EMPAT)).

Remediation Equipment

There are various types of equipment useful in mold assessment and remediation. Some of the more common items include:

Moisture Meters

Moisture meters measure/monitor moisture levels in building materials and may be helpful for measuring the moisture content in a variety of building materials following water damage. They also can be used to monitor the progress of drying damaged materials. These direct reading devices have a thin probe that is inserted into the material to be tested or pressed directly against the surface of the material. Moisture meters can be used on materials such as carpet, wallboard, wood, brick, and concrete.

Humidity Gauges or Meters

Humidity meters can be used to monitor indoor humidity. Inexpensive (less than $50) models that monitor both temperature and humidity are available.

Humidistat

A humidistat is a control device that can be connected to an HVAC system and adjusted so that if the humidity level rises above a set point, the HVAC system will automatically turn on and reduce the humidity below the established point.

Boroscope

A boroscope is a hand-held tool that allows users to see potential mold problems inside walls, ceiling plenums, crawl spaces, and other tight areas. It consists of a video camera on the end of a flexible “snake.” No major drilling or cutting of dry wall is required.

HVAC System Filter

High-quality filters must be used in a HVAC system during remediation because conventional HVAC filters are typically not effective in filtering particles the size of mold spores. Consult an engineer for the appropriate filter efficiency for your specific HVAC system, and consider upgrading your filters if necessary. A filter with a minimum efficiency of 50 to 60% or a rating of MERV 8, as determined by Test Standard 52.2 of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, may be appropriate.

Remember to change filters as appropriate, especially following any remediation activities. Remove filters in a manner that minimizes the reentry of mold and other toxic substances into the workplace. Under certain circumstances, it may be necessary to wear appropriate PPE while performing this task.

How Do You Know When You Have Finished Remediation/Cleanup?

- You must have identified and completely corrected the source of the water or moisture problem.
- Mold removal should be complete. Visible mold, mold-damaged materials, and moldy odors should no longer be present.
- Sampling, if conducted, should show that the level and types of mold and mold spores inside the building are similar to those found outside.
- You should revisit the site(s) after remediation, and it should show no signs of moldy or musty odors, water damage, or mold growth.

Conclusion

After correcting water or moisture infiltration, the prompt removal of contaminated material and structural repair is the primary response to mold contamination in buildings. In all situations, the underlying cause of water accumulation must be rectified, or the mold growth will reoccur. Emphasis should be placed on preventing contamination through proper building and HVAC system maintenance and prompt repair of water damaged areas.

Effective communication with building occupants is an essential component of all large-scale remediation efforts. The building owner, management, and/or employer should notify occupants in the affected area(s) of the presence of mold. Notification should include a description of the remedial measures to be taken and a timetable for completion. Group meetings held before and after remediation with full disclosure of plans and results can be an effective communication mechanism. Individuals with persistent health problems that appear to be related to mold exposure should see their physicians for a referral to practitioners who are trained in occupational/environmental medicine or related specialties and are knowledgeable about these types of exposures.

Personal Protective Equipment (PPE)

PROGRAM OBJECTIVE

The purpose of this program is to protect TCF Center workers against the hazards of projectiles, splashes, and incidental contact with hazardous chemicals. Personal protective equipment (PPE), including protective equipment for eyes, face, head, hands, and protective clothing, will be provided by ASM Global at no cost to its employees whenever and wherever necessary. The use of PPE will be based upon evaluations of the tasks and as dictated by the potential hazards identified. Hearing protection and respiratory protection are addressed in separate programs.

SCOPE

This program covers all employees and the required PPE they are provided. Under this program, employees shall wear PPE when applicable. This PPE program includes:

- Hand Protection - Gloves
- Industrial safety glasses and protective goggles
- Protective clothing
- Steel Toe Shoes (where applicable & depending on nature/scope of job assignment)

NOTE: Hearing, electrical safety protection and respiratory protection are addressed in those specific programs.

ASSESSMENT

ASM Global has assessed its workplace to determine if hazards are present, or are likely to be present, which necessitate the use of PPE. ASM Global understands that these assessments need to be made periodically as well as when new procedures, tasks or materials are introduced in the work area. ASM Global has selected what it considers to be appropriate PPE to protect affected employees from the identified hazards while also taking comfort and ease-of-use into account. This will ensure acceptance by employees and subsequent usage whereas other PPE may be shunned – and therefore not protective. Employee input on PPE selection will be sought when possible.

CERTIFICATION

The Facility Manager shall be responsible for certifying that tasks have been assessed for the use of PPE and that the required PPE be available **and** used.

PPE not used when necessary cannot provide any protection.

Whenever possible, a Job Safety Analysis (JSA) will be performed on common repetitive production tasks, as necessary, to identify new risks that will be mitigated through the use of personal protective equipment. ASM Global's overall safety and health program outlines the JSA process and the schedule for JSAs. The JSA performed will include the date it was conducted, the name of the specific task and will be reviewed by the VP of Production who will sign it to verify the certification. The PPE determined to be essential, and therefore required, by ASM Global will be listed in each JSA.

PROCUREMENT AND REPLACEMENT

The Department Manager is directly responsible for the supply, storage, availability and, most importantly, the usage of required PPE. Employees who habitually neglect to wear required PPE will be re-trained and disciplined. Continued failure to wear required PPE or follow established work safety rules will result in disciplinary action which may include dismissal for 'flagrant and/or habitual violators. The Director of Human Resources has overall responsibility for this program, including the management of unit supervisors who directly oversee the use of PPE.

TRAINING

ASM Global will provide training to employees required to use PPE for a job or task. The training will include the following elements:

- What PPE is required

- When and where PPE is necessary
- Why PPE is necessary
- How to care for their PPE
- How to properly put on, take off, adjust, and wear PPE
- The limitations of the PPE
- The proper maintenance, useful life, and disposal of the PPE
- How to obtain new PPE

When ASM Global has reason to believe that any affected employee who has already been trained does not have the understanding and skills to properly use the PPE, the employee shall be re-trained. Some reasons for re-training may include:

- changes in the workplace render previous training obsolete
- changes in the types of PPE to be used render previous training obsolete

Deficiencies in an affected employee's knowledge or use of assigned PPE may indicate that the employee has not retained the requisite understanding or skill. Such deficiencies *must be* separated from lapses in discipline by the employee who "forgets" the required use or maintenance. Habitual failure to wear required PPE is not a training issue. It is a disciplinary issue that and will be treated as such – see Procurement and Replacement section above.

PAYMENT FOR PERSONAL PROTECTIVE EQUIPMENT

ASM Global understands that it shall be responsible for purchasing and supplying required PPE. Some exceptions apply.

ASM Global is <u>not</u> required to pay for:

- everyday clothing, such as shirts, long pants, street shoes, and non-safety normal work boots
- ordinary clothing, skin creams, or other items used solely for protection from weather, such as winter coats, jackets, gloves, parkas, rubber boots, hats, raincoats, ordinary sunglasses, and sunscreen
- replacement PPE when the employee has habitually lost or intentionally damaged the protective equipment

EYE AND FACE PROTECTION STANDARDS

Eye protection is required by all housekeeping personnel when using cleaning chemicals. Carpenters and other trades using powered tools, including saws, bench grinders and nail guns must use industrial level safety glasses at all times when using such tools.

Although not normally defined as personal protective equipment, ASM Global has several emergency eyewash stations throughout the facilities. Unplumbed stations are to be examined to assure they are available for instant use and the water changed at least every 6 months. Plumbed stations will also be inspected as part of the management audits required by ASM Global's Safety and Health program; this inspection will include actuation at least every 3 months to clear residual rust and debris from the pipes.

BODY PROTECTION

Employees required handle corrosive liquids shall be provided with and use full frontal body apron impervious to the corrosive chemical.

HEARING PROTECTION

Hearing protection is required for employees who work in the Ice Making Room, also known as the Chiller Room. See ASM Global's hearing protection program for more details.

HAND PROTECTION

ASM Global shall require employees to use appropriately selected hand protection when employees' hands are exposed to hazards from the following: skin absorption of harmful substances; cuts or lacerations; abrasions; punctures; chemical burns; thermal burns; and/or harmful temperature extremes. Selection of the appropriate hand protection will be based upon on an evaluation of the performance characteristics of the gloves relative to the task(s) to be performed, the conditions present, duration of use, and the hazards and potential hazards identified.

ASM Global requires all housekeepers to use hand protection when using cleaning chemicals.

CHEMICALY RESISTANT GLOVES

Where gloves are needed to protect employee's hands from chemical exposure, the gloves shall be selected based upon its resistance to the challenge substance, job required dexterity, durability, and to the extent possible - comfort**.** With the possible exception of the limited exposure to corrosive water treatment chemicals the vast majority of the hazardous chemicals used at the TCF Center are those found in light industry or for sale use by private consumers.

ELECTRICALLY INSULATING PPE

ASM Global does not expect its maintenance personnel to work on or near energized equipment or parts. If such parts cannot be de-energized using approved LOTO procedures, the job or tasks shall only be performed by a "Qualified" electrician.

NOTE- See ASM Global's Safe Electrical Work Practices Program for more guidance on the use of PPE protections against electric shock and burns.

HEAD PROTECTION

ASM Global will ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling objects or overhead contact with an object. A protective helmet designed to reduce electrical shock hazard is required when working near exposed electrical conductors that could contact the head.

All hard hats are classified according to the specific impact and electrical performance requirements they are designed to meet as set down in ANSI Z89.1. ASM Global will specify Class I, Type E for its employees.

SUPPORTING REFERENCES

- 1910.132, 133, 135… Personal Protective Equipment for General and specific applications
- Non-mandatory Compliance Guidelines for 1910 Subpart I App B Hazard Assessment

Permit Confined Space

PROGRAM OBJECTIVE

The purpose of this program is to protect TCF Center workers against the hazards related to **permit required** confined spaces (PRCS). This procedure establishes the controls and responsibilities for entering and exiting confined spaces in order to help ensure the safety of employees. Furthermore, this policy is intended to prevent TCF Center employees or contractor employees from entering a confined space that has not had the actual or potential atmospheric hazards eliminated and all other serious hazards eliminated or controlled.

SCOPE

This program covers all employees (TCF Center and Contractor) who are required to enter confined spaces identified at TCF Center (air handlers and sanitation ejection pits) and any other structure or equipment that, by definition, could be a permit required confined space. It also covers contractors who may be hired by TCF Center to conduct PRCS entries on TCF Center's premises.

DEFINITIONS

"Acceptable entry conditions" means the conditions that must exist in a permit space to allow safe entry for identified work tasks.

"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" mean the closure of a line, duct, or pipe by closing and locking / tagging two in-line valves whereby a vent valve in between the two valves are locked or tagged open for venting or draining.

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

"Engulfment" means the surrounding and capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling / 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 is considered to have occurred as soon as <u>any</u> part of the entrant's body breaks the plane of an opening into the space and may include the ensuring work activities as well.

"Entry permit (permit)" means the written or printed document that is provided by the employer to allow, and control, entry into a permit space.

"Entry supervisor" means the person (such as the HVAC Foreman) responsible for determining if acceptable entry conditions are present where a permit space entry is planned in order to authorize entry, oversee entry operations, and terminate 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, impairment of ability to self-rescue (i.e.: 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) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this Part and which could result in employee exposure in excess of its dose or permissible exposure limit;

NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is **<u>not</u>** covered by this provision.

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

NOTE: For air contaminants in which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as compliant Material Safety Data Sheets, published information, and internal documents may provide guidance in establishing acceptable atmospheric conditions.

"Hot work permit" means the employer's written authorization to perform an operation capable of providing a source of ignition such as riveting, welding, cutting, burning, or heating.

"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 – such as hydrogen fluoride gas and cadmium vapor -- 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 may "feel normal" from recovery from transient effects until such collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

"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.

"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-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.

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

"Retrieval system" means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces. TCF Center / ASM Global have determined that all of its PRCS constitute spaces that could effectively utilize non-entry rescue techniques (e.g.: wristlets).

"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.

Atmospheric 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, space entry. **Toxic, flammable or oxygen deficient atmospheres are the leading cause of employee deaths in confined spaces.**

ASSESSMENT

ASM Global has performed an assessment of TCF Center and has identified two PRC spaces. The HVAC units – “air handler units” -- and the sanitation ejection pit requiring periodic high-pressure water cleaning.

HVAC units need to be entered for inspection and replacement of filters and maintenance work on fans including the fans motor and means of power transmission which is typically V-belts and pulleys.

RESPONSIBILITIES

TCF Center’s Manager of Engineering Services shall be directly responsible for ensuring that personnel are in compliance with this program. PRIOR TO ANY ENTRY, the entry will be personally discussed with the site Manager of Engineering Services or the Facilities Manager. The Manager of Engineering and the Facilities Manager shall ensure that only trained employees assume roles and perform work in confined spaces in accordance with this program. The Engineering and Facilities Managers shall ensure that a periodic review of the overall effectiveness of the Confined Space Program/Procedures is completed at least once per year. In the case of air handler entry wherein the hazards within the space are controlled using proper LOTO procedures, the Managers shall ensure that proper procedures that isolate the fan motor and block the fan from rotating are in

place. Additionally, all doors into the air handlers that lead to a space open to rotating fan or its power transmission are properly marked to notify employees that it is a Permit Required Confined Space.

TCF Center's Manager of Engineering Services and Facilities Manager are responsible for the **direct** oversight of any PRCS entry including those performed by contractors to clean out sanitary ejection pits.

A space classified by, or otherwise assumed by, the employer as a permit-required confined space may be reclassified as a non-permit confined space under the following procedures:

- If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.

- The Engineering and Facilities Managers shall document the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification shall be made available to each employee entering the space or to that employee's authorized representative.

Additional Manager Responsibilities

- Controlling the entry area and limiting access to the area during the entry

- The Certification required by 1910.146(c)(7)

    - Documenting and certifying with his signature the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date and the location of the space. The certificate shall be made available upon request to each employee entering the space.

- Ensuring that the entrants are visually observed, without exception and/or are in constant voice communication with a stand-by attendant.

IT SPECIFIC Responsibilities

- When entering a confined space during normal day to day operations that do not require a permit, all work will be done in pairs with one of the entrants stationed outside the space with cell phone or radio communication capabilities to hasten the response to call for assistance.

SANITATION EJECTION PITS - Prohibited Entry for <u>ALL</u> TCF Center / ASM Global Employees

In all cases, Sanitation Ejection Pit entries will occur only when necessary and only by outside contractors who can demonstrate that they have the requisite training, experience and skills for entry to perform the task and conduct a safe **non-entry** rescue.

When an outside contractor is hired to perform PRCS work, Manager of Engineering Services will ensure he/she:

- Informs the contractor IN WRITING that they will be entering a permit space and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of 29 CFR 1910.146 including, at a minimum, the following;
    - atmospheric testing for percent oxygen, flammable gas, toxic gas to ensure a safe entry condition
    - the use of forced ventilation to ensure that safe conditions are maintained during entry
    - the use of tripod, harness, and at least two stand-by attendants to affect an emergency rescue
- Obtains from the contractor written assurance that they have experience entering such spaces and will be in compliance with OSHA's requirements.
- Receives a copy of the permit signed by the contractor PRIOR to their employee's entry

Additionally, TCF Center's Manager of Engineering Services will

- Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working.
- Debrief the contractor at the conclusion of the entry operations regarding the permit space program and any hazards confronted or created in permit spaces during entry operations.
- Ensure the hatchway to these pit(s) is kept locked at all times unless a PRCS entry is underway.
- Ensure Danger signs are installed on top of the hatchway as required by 1910.146.

HVAC UNITS

The following Question and Answer is a direct excerpt from a letter of interpretation written by OSHA concerning HVAC units and their coverage under 1910.146 on October 27, 1995 to:

Mr. James Sharpe
Consolidated Engineers Services
2345 Crystal Drive
Suite 1000
Arlington, Virginia 22202

Question: Are fan chambers and return air shafts served either by standard size doors or smaller openings confined spaces both when the heating, ventilating, and air-conditioning unit that serve these fan chambers and air shafts is operating, and when it is not?

OSHA's Answer:

For the purposes of this response, we assume that fan chambers and return air shafts are components of heating/ventilating/air conditioning (HVAC) equipment and not architectural spaces. A standard door is one in which a person, passing through the plane of the door, is not forced to enter or exit in a posture that might slow self-rescue, or makes rescue more difficult (i.e., stoop or bend over and/or step over a raised threshold).

HVAC equipment with a standard door would not normally be considered a confined space. HVAC equipment with access other than through a standard door would be considered a confined space. A confined space which has a hazard characteristic found in the definition of a permit-required confined space must be classified as such. The most likely hazards contained in the HVAC equipment components in question are mechanical (i.e., fan

blades, chain, and belt drives) and can be eliminated either through guarding or energy source isolation (lockout/tag out). In situations where all hazards can be eliminated through permanent guarding, a permit-required confined space may be classified as a non-permit confined space. Where the physical hazard of a permit space cannot be eliminated through permanent guarding, the permit space can be reclassified as a non-permit space under paragraph 1910.146(c)(7) once temporary (for the duration of the entry) measures are taken that eliminate the hazard. When entry into the confined space is required to accomplish guarding or energy isolation, full permit space entry procedures must be instituted until the hazard is eliminated.

With respect to 1910.146(c)(7)(iii) and when entry is accomplished by one employee who, is the evaluator, certifier, and entrant, not providing a certification document will be viewed as a **de minimis** violation (one in which no citation and civil penalty will be issued) under the following conditions:

1. The only actual or potential hazards in the space are electrical or mechanical.
2. The hazards of the space have been previously identified and the employee is trained on the hazards and the proper lockout methods.
3. The servicing employee has absolute control of the locks.
4. No additional hazards are introduced into the space**.**

Employee Training

TCF Center employees entering HVAC units that are PRCS due their limited ingress and egress, moving fan blades, and unguarded belts and pulleys will be trained as Authorized under 1910.147 and/or Qualified under 1910.333 depending upon the type of potential energy. Additionally, **no** entry into an HVAC unit that does not have a standard doorway, even if it is to do a visual inspection and where there is no exposure to moving mechanical parts will be performed solo. All work will be done in pairs with one of the entrants stationed outside the unit with radio communication capabilities to hasten the response to call for assistance.

If the reason to enter the space is to perform any work that would introduce a potentially hazardous atmosphere, **TCF Center / ASM Global EMPLOYEES shall take all safety precautions necessary to mitigate any and all hazards. Employees shall notify Supervisor in the event that a hazard cannot be negated**. This includes any hot work, spraying of solvent based materials including paints, lubricants, or cleaning materials. This work will be contracted to specialists fully trained and properly equipped. However, as part of its obligation under 1910.146, TCF Center will ensure that the potential energy within the space is properly isolated per its own LOTO policy. To enhance worker safety, TCF Center will require that the contractor use CONTINUOUS forced ventilation to protect its employees during any work which may introduce a potentially hazardous atmosphere including any hot work.

Powered Industrial Trucks (PIT)

OBJECTIVE

To ensure that TCF Center employees receive the training they need to safely operate the company's industrial trucks and to ensure that the trucks are maintained and utilized in a safe manner.

SCOPE

TCF Center currently has several powered industrial trucks. The forklift trucks are electrical, and propane powered. Additional trucks, including pallet trucks are powered by battery. This program covers truck maintenance, battery charging, the training of the truck's operators, unloading / loading of over-the-road trailers, warehouse materials handling, man-lift activities and any other appropriate uses deemed necessary by TCF Center / ASM Global management.

MODIFICATIONS

Modifications and additions which affect capacity and safe operation shall not be performed by TCF Center personnel without the manufacturer's prior written approval. If the truck is equipped with front-end attachments *other than factory installed attachments*, TCF Center management will request that the truck be marked by the manufacturer to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered.

MANLIFTING

Man-lifting via a forklift platform is strictly PROHIBITED at TCF Center.

PROPANE POWERED TRUCKS USED AT TCF CENTER

- Store and handle liquefied petroleum gas shall be in accordance with NFPA Storage and Handling of Liquefied Petroleum Gases (NFPA 58-1969). Contact Environmental Safety for assistance in setting up LPG storage.
- The fuel cylinder must always be secured in the brackets when the truck is in operation using the index pin as a reference point.
- If there is a leak in the fuel system, shut off the fuel cylinder valve and take the truck out of service.
- Close the valve on the fuel cylinder when work with the truck is done for the day.
- Shut off and remove the LP gas tank "garaging" the truck (leaving the lift truck in a closed space or room or leaving the truck out of service for 24 hours or more). After the gas is shut off, run the truck engine to burn off fuel remaining in the fuel lines.
- If a fuel cylinder leaks, take it outside well away from the building and any sources of ignition. Notify TCF Center Security. Secure the area and allow the cylinder to empty itself. It may be very dangerous to attempt to repair the leak.
- No smoking or open flames.

CARBON MONOXIDE

Carbon monoxide (CO) is odorless, tasteless, colorless, non-irritating and cannot be detected by any of the senses. Because it cannot be detected, employees can be exposed to very high levels without realizing there is a problem. It is a by-product of the combustion of LPG. It is important to keep LPG trucks well-tuned to prevent excessive production of carbon monoxide. The use of LPG trucks in enclosed areas with poor ventilation can create a hazardous condition to the operators in a short period of time.

Early symptoms of CO exposure are flu-like and nonspecific: headache, nausea, dizziness, visual disturbances, and rapid breathing. A person may feel weak and disoriented, making it difficult to escape the environment. Organs that are highly dependent on oxygen – such as the brain and heart – are essentially "starved" during CO poisoning, and severe poisoning can lead to unconsciousness, permanent brain injury and death. In pregnant women, CO can reach the fetus and cause harm.

CO does not accumulate in the body. Once exposure has stopped and fresh air is inhaled, the lungs exhale CO and it is removed from the body. Breathing pure oxygen can be administered to speed the removal of CO from the blood.

LOADING AND UNLOADING TRAILERS

The brakes of highway trucks shall be set, and wheel chocks placed under the rear wheels to prevent the trucks from rolling while they are boarded with powered industrial trucks.

Additionally, the following precautions shall be taken before a forklift enters a truck trailer:

- When tractor is coupled to the trailer, ensure the vehicle's brakes are set.
- Chock the trailer's wheels.
- Install fixed jacks to support a semi-trailer that is not coupled to a tractor to prevent it from upending.
- Make sure the height of the vehicle's entrance door clears the forklift height by at least 2 inches.
- Trucks shall not be used for opening or closing trailer doors.
- Overhead guards shall NOT be removed to accommodate trailer heights. In the event this becomes necessary, only a "walkie lift" shall be used.
- Make sure floors can support the combined weight of the forklift and the load.
- Inspect interior of a vehicle for the following: trash, loose objects, and obstructions; holes or weak floors; poor lighting; and low overhead clearance.
- Install anti-slipping material in any area that could be a hazard because of weather conditions.
- Ensure that lighting is sufficient for safe unloading / loading in the event night work is necessary
- Ensure that docks and dock plates are clear of obstructions and are not oily or wet.
- Stay clear of edges of docks, rail cars or ramps. Have edges clearly marked.
- Make sure that the dock plate is properly secured and can support the load before driving over it. (Load weight should be clearly marked.)
    - Never push trucks with a forklift.
    - At a minimum, dock-plates must:
        - Be adequately secured between the truck and dock
        - Have an anti-slip tread
        - Have loops or handles for safe handling
        - Know and abide by the capacity limit(s)

PRE-OPERATION INSPECTION

TCF Center management requires its operators to conduct a pre-operation inspection of the industrial truck at the beginning of each shift. This inspection list will be based upon the type of truck but should, at a minimum, include the following:

OK	NOT	ITEMS TO BE CHECKED
____	____	Tires
____	____	Horn
____	____	Lights
____	____	Lift System to include load limit switches, load engagement means, chains, cables, forks,
____	____	Brakes (normal and emergency)
____	____	Steering Mechanism, Free play in steering

____ ____ Leaks in hydraulic system. Check hydraulic fuel level
____ ____ Overhead guards broken or damaged
____ ____ Gauges working properly
____ ____ Seat belts work properly
____ ____ Engine oil
____ ____ Transmission fluid
____ ____ Label or identifying mark indicating approval by a testing laboratory present
____ ____ All name plates and markings are in place and maintained in legible condition

The inspection list above is not absolute and can be modified to fit particular needs. Additional items can be added as deemed appropriate. Inspection records will be reviewed and archived on a daily basis by the Senior Operations Manager**. Trucks found to have deficiencies will be taken out of service until it is repaired.** Removing a truck from service is accomplished by taking the key out and turning it over to the appropriate supervisor or the Senior Operations Manager.

SAFE TRUCK OPERATIONS

- Trucks shall not be driven up to anyone standing in front of a bench or other fixed object.
- No person shall be allowed to stand or pass under the elevated portion of any truck (loaded or not).
- Unauthorized personnel shall not be permitted to ride on powered industrial trucks.
- Arms or legs shall never be placed between the uprights of the mast or outside the running lines of the truck
- When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked / chocked if the truck is parked on an incline.
- ASM Global considers a powered industrial truck unattended when the operator is 25 ft or more away from the vehicle but remains in their view or whenever the operator leaves the vehicle, and it is not in their view.
- When the operator of an industrial truck is dismounted and within 25 ft of the truck while still in their view, the load engaging means shall be fully lowered, controls neutralized, and the brakes set to prevent movement.
- A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform or freight car.
- An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application. It is not intended to withstand the impact of a falling capacity load.
- All traffic regulations shall be observed, including authorized facility speed limits **< 3 mph in all service corridors, corners, and intersections**. A safe distance shall be maintained approximately three truck lengths from the truck ahead, and the truck shall be kept under control at all times.
- The driver shall be required to slow down and sound the horn at cross aisles and other locations where vision is obstructed.
- If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
- Driver must have leader personal when traveling around groups / crowds of people.
- The driver shall be required to look in the direction of, and keep a clear view of, the path of travel.
- Grades and inclined ramps shall be ascended or descended slowly.
- When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade.
- On all grades, the load and load engaging means shall be tilted back, if applicable, and raised only as far as necessary to clear the road surface.

- Under all travel conditions, the truck shall be operated at a speed that will permit it to be brought to a complete stop in a safe manner.
- Stunt driving and horseplay will not be permitted.
- Drivers shall be required to slow down for wet and slippery floors.
- Running over loose objects on the roadway surface shall be avoided.
- While negotiating turns, speed shall be reduced to a safe level by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel shall be turned at a moderate, even rate.
- **Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot otherwise be centered**.

    - The operator shall be aware of the triangle of stability and that how the load is distributed (LOAD CENTER) on the forks can influence stability and instability by shifting the trucks center of gravity

- Only loads within the rated capacity of the truck shall be handled.
- The long or high (including multiple-tiered) loads which may affect capacity shall be properly adjusted.
- Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load (e.g.: man-lift platform).
- A load engaging means shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.
- Extreme care shall be used when tilting the load forward or backward, particularly when high stacking. Tilting forward with load engaging means elevated shall be prohibited except to pick up a load. An elevated load shall not be tilted forward except when the load is in a deposit position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load shall be used.

OPERATOR TRAINING

TCF Center management shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of training and evaluation. Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the operator shall have successfully completed the TCF Center / ASM Global training program. Operators who have not been fully trained, or otherwise have not demonstrated their competence, may operate a powered industrial truck only:

- Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and
- Where such operation does not endanger the trainee or other employees.

TCF Center / ASM Global's training consists of a combination of formal instruction (e.g. lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace. All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence. A TCF Center / ASM Global operator who has 3 or more years of experience and an exemplary safety record may conduct the "practical" aspect of the required training.

Powered industrial truck operators at TCF Center shall receive initial training. However, where an individual who has been previously trained in accordance with 1910.178 (i.e. formal, practical and evaluation) is hired and can demonstrate competence via an ASM Global / TCF Center management evaluation, such individuals will be allowed to operate trucks without comprehensive training. (SEE DUPLICATIVE TRAINING below).

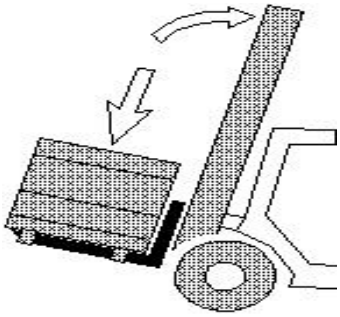
TRAINING CONTENT

- Differences between the truck and the automobile.
- 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.
    - Triangle of stability
    - Center of Gravity – the 'see-saw' concept
    - Load Center
    - Effect of load center on truck stability
- Any vehicle inspection and maintenance that the operator will be required to perform.
- Charging and recharging of batteries.
- Operating limitations.
- Carbon monoxide hazard associated with LPG powered trucks
- Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

- Specific Workplace-related topics:
    - Surface conditions where the vehicle will be operated.
    - Composition of loads to be carried and load stability.
    - Load manipulation, stacking, and un-stacking.
    - 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 (i.e.: cheese and flammability rooms).
    - 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 buildup of carbon monoxide or diesel exhaust.
    - Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.
    - The requirements of OSHA standard for powered industrial trucks 1910.178
    - Importance of wearing the seat belt
    - Importance of staying with the truck and keeping yourself and your body parts inside the vehicle.
        - Set the brake before reaching out for objects, handles, or switches.
        - Keep your hands and fingers inside the frame – especially when turning to look behind you while traveling in reverse.

- If the vehicle tips over, DO NOT JUMP! Grasp the steering wheel – not the overhead guard or supports – and lean away from the fall.

Drive in reverse if you cannot see past your load.



Tilt the mast back and keep the load low for stability while traveling.

- Use extra caution when handling loads that approach the truck's maximum rated capacity:
  - Tilt the mast back and position the heaviest part of the load against the carriage.
  - Travel with the mast tilted back to keep the load stable.
  - Do not operate a forklift if the back wheels begin to lift off the ground. The forklift is overloaded.
- Never travel with the load elevated.

REFRESHSER TRAINING AND EVALUATION

- Refresher training, including an evaluation of the effectiveness of that training, shall be conducted to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.
- Refresher training in relevant topics shall be provided to the operator when:
  - The operator has been observed to operate the vehicle in an unsafe manner.
  - The operator has been involved in an accident or near-miss incident.
  - The operator has received an evaluation that reveals that the operator is not operating the truck safely.
  - The operator is assigned to drive a different type of truck; or
  - A condition in the workplace changes in a manner that could affect safe operation of the truck.
- An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years

DUPLICATIVE TRAINING

If an operator has previously received training on a specified topic, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the truck safely.

TRAINING RESOURCE

ASM Global has identified an excellent training resource at:

http://www.free-training.com/osha/forklift/forkmenu.htm

29 CFR 1910.178 OSHA's Powered Industrial Truck Standard

OSHA Powered Industrial Trucks (Forklift) eTool; http://www.osha.gov/dcsp/products/etools/pit/index.html (accessed 10/22/2008)

OSHA Compliance Directive: CPL 02-01-028 - CPL 2-1.28A - Compliance Assistance for the Powered Industrial Truck Operator Training Standards.

CERTIFICATION

TCF Center / ASM Global management will certify that each operator has been trained and evaluated. The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

Respirator

PURPOSE

ASMG TCF Center has no reason to believe that its painters are being over exposed to hazardous chemicals. However, due to the unplanned and unanticipated demands of some shows, there may be a need for protection from sustained exposure to solvent vapors during painting operations and ASMG TCF Center wants to prevent unnecessary exposures as a matter of prudent management and good practice. It also wants to provide a comfortable work environment that prevents any possible effects associated with sub-PEL exposures. Therefore, ASMG TCF Center is requiring the use of respiratory protection by its painters for all solvent based tasks – either applying or removing.

In order for an ASM Global facility to create a safe environment for all of its employees and guests, individual safety programs, plans or initiatives **must** be developed. The following program relates to a Respirator Safety Program.

The Respirator Safety Best Practice Program that has been developed can be utilized as a guide for all ASM Global facilities in achieving compliance to the OSHA State Regulations. The ASM Global Respirator Best Practice Program intent is to protect employees by developing a program that will educate management, employees, and outside contractors on the importance of this program.

STANDARD OPERATING PROCEDURE

I. Assignment of Responsibility

A. Employer

1. Select alternate chemicals or processes to eliminate the workplace hazard as a primary objective.
2. When impractical or not feasible to eliminate the respiratory hazard, then select proper type and correct fitting respirators for employees to use when necessary.
3. Provide training courses.
4. Provide medical evaluations and follow up care, if necessary.
5. Conduct Industrial Hygiene surveys when necessary.
6. Appoint a program coordinator to supervise the program.
7. Keep lines of communications open for employees.

B. Program Coordinator

1. Identify processes or areas of the facility where respirators may be needed.
2. Utilize resources to evaluate the hazards.
3. Assist in the selection of the proper respirator.
4. Oversee the use of respirators. Right one for the right condition.
5. Establish training format.
6. Assist in providing proper storage areas for the respirators.
7. Oversee the medical surveillance program for users.
8. Maintain files /records relating to the program.
9. Keep written program current to the facility process.

C. Supervisors

1. Make sure the program is followed by their employees.
2. Know the program content.
3. Make sure all employees, including new hires, receive the training, fit testing, and annual medical evaluation.
4. Keep respirators/filters in stock for employee use.
5. Know the task that require the use of respirators.
6. Spot check that respirators are clean and stored properly by employees.
7. Periodically, observe self-check – fit testing by employees.
8. Be aware of any process changes that could affect the program.
9. Work closely with the Program Coordinator to maintain a strong program.

D. Employees

1. **MUST** wear their respirator, properly, when the task requires them do to so.
2. **MUST** care for and maintain the condition of their respirator.
3. **MUST** notify their immediate supervisor if there is a fit /function issue with their respirator.
4. **MUST** contact their supervisor if an issue needs to be addressed (air contaminants/fumes, dust, etc.).
5. **MUST** follow the respirators manufacturer's instructions and the training they received via the ASM Global Respirator Safety Program.

II. Program Clarification

The ASM Global Respirator Safety Program applies to all employees who are required to wear respirators

during normal work operations. It covers employees who may have to perform non-routine or emergency operations, such as a hazardous spill or an accidental release of a chemical process.

If an employee voluntarily wears a respirator when it is not actually required by this program, they **must** submit to the medical evaluation, cleaning, maintenance, and safekeeping (storage) of the respirator. They will be afforded the formal training program as well.

Employees using filtering face pieces (dust masks) do not fall under the guidelines stated above.

III. Program

A. Hazard Assessment/Respirator Selection

1. Identify and develop a list of hazardous substances (SDS documents).
2. Survey the work process/locations in order to determine where potential exposures to hazardous environment may exist/occur.

3. Industrial Hygiene (IH) air sampling **should** be conducted to confirm the need for respirator usage or clear the requirement due to lack of air contaminants.
4. Document respirator selection based on IH air sampling data.

B. Hazard Assessment – Updates

1. If the work process changes a new hazard assessment **should** be conducted.
2. If an employee believes an area was missed or overlooked, his/her supervisor **should** be contacted.
3. Supervisors need to pass this information onto Management Personnel/ Program Coordinator.

C. Training – Course Topics to Cover

1. ASM Global site-specific Respirator Safety Program.
2. Cover the OSHA Respiratory Protection Standard 1910.134.
3. Respiratory hazards that may exist at the specific ASM Global facility.
4. Proper selection and use of respirators.
5. What the limitations of the respirator may be.
6. How to wear a respirator.
7. How to fit test a respirator.
8. Review emergency use procedures.
9. How to care for and store a respirator.
10. Signs of how to tell a respirator is not working properly.
11. Annual / or as needed training regimen.
12. Employee **must** demonstrate how to use the respirator.
13. Pass a written test on topics relating to the program and the workings of a respirator and its components.

D. NIOSH Certification

All respirators **must** be certified by the National Institute for Occupational Safety and Health. All filters, cartridges and canisters **should** be labeled with the appropriate NIOSH labels. Labels **must** not be removed or defaced while in use.

E. Voluntary Respirator Use

1. Authorized by a member of management or the Program Coordinator.
2. Performed on a case by case situation – dependent on the workplace conditions or medical reasons that have been documented.
3. Users of dust mask do not enter into the medical evaluation, respirator cleaning, maintenance, and storage portions of the ASM Global Respirator Safety Program.

F. Medical Evaluation

1. Employees who need to wear a respirator or voluntarily wear one, **must** pass a medical exam, which is provided by ASM Global selected medical care location.
2. Exam **must** be completed before the respirator is issued for employee use.
3. Medical questionnaire is utilized for all medical evaluations, Appendix C of the OSHA Respiratory Protection Standard. Given to each employee participating in the program.
4. Follow up medical exams will be allowed as required by the Standard.
5. A copy of the Respirator Safety Program **should** be made available to the examining physician, if needed the OSHA 1910.134 standard **should** be provided to the physician as well.
6. Once passed to use the respirator, additional medical evaluations may be required:

a. Employee experiences breathing difficulties, shortness of breath, b. Experiencing chest pains or wheezing
c. If the examining physician or supervisor a need for reevaluation
d. Management observation of difficulties during fit testing/donning

7. All examinations /questionnaires are to remain CONFIDENTIAL between the employee and the physician. The Program Coordinator/Human Resources will receive and keep a copy of the physicians written recommendations regarding each employee's ability to wear a respirator.

G. Fit Testing occurs

1. Prior to wearing a tight-fitting face piece.
2. Annually.
3. changes in employee's physical condition that could affect the fit, weight loss, facial scarring, or changes, etc.
4. Performed with the unit they will be wearing.
5. Fit tests **must** follow the OSHA Respiratory Protection for fit testing, 1910.134(f)(1).

H. General Respirator Use Procedures

1. Employees **should** use the respirator as they were trained, for the work process they are performing.
2. Employees **shall** conduct seal checks each time they don their respirator. Use of positive or negative pressure check.
a. Positive Pressure Test- close off the exhalation valve with your hand. Breathe air into the mask. If the seal remains and no air escapes the fit is good.
b. Negative Pressure Test- cover the inlet opening of the cartridge with the palm of your hand. Inhale gently so that a vacuum occurs within the face piece. Hold your breath for ten seconds. If the vacuum remains, and don inward leakage is detected, the respirator is fit properly.

3. Employees cannot wear tight-fitting respirators if they have facial scars, facial hair, or missing

dentures. May prevent a proper seal of the unit.
4. The entire respirator unit **should** be inspected prior to and after use. Straps, face piece, valves, filter holders, etc.

5. Wearing headphones, jewelry, or other items that may interfere with the seal between the face and the face piece is prohibited.

I. Air Quality

1. For supplied –air respirators, only Grade D breathing air **shall** be used in the cylinders.
2. There **should** be one fully charged replacement cylinder for each SAR (supplied –air respirator) unit.

J. Change Schedule – Respirator cartridges – manufacturer recommendation Employee use as needed.

K. Cleaning

1. Remove filters/canisters/cartridges.
2. Wash face piece and all parts (not cartridges/or headbands) in a disinfectant solution in warm water. Use a hand brush to remove dirt.
3. Rinse completely in clean, warm water.
4. Disinfect all facial contact area by spraying the unit with an approved disinfectant.
5. Air Dry in a clean area.
6. Reassemble unit and replace any defective parts. Insert new filters and test the seal for tightness.
7. Place the unit in a clean, dry plastic bag or other airtight container.

L. Maintenance

1. Respirators **shall** be inspected before and after each use.
2. Emergency use respirators **shall** be inspected after every use or at least monthly.
3. Utilize a check list to maintain record of inspecting Emergency Units.

M. Storage

1. **Should** be protected from dust, sunlight, heart, extreme cold, excessive moisture, and damaging chemicals.
2. Emergency respirators **must** be stored in proper cabinets /compartments to protect them and be readily accessible.

N. Program Evaluation

1. **Should** be performed periodically.
2. Discuss the program with employees and the supervisors.
3. Site inspection **should** be performed as well.
4. Possible air monitoring survey.
5. Review the records of the active program for the specific ASM Global facility.

O. Recordkeeping

1. A copy of the written ASM Global Respirator Safety Program **should** be made available to the affected employees and the management staff at the facility.
2. All training records /fit test records **should** be on site as well.
3. The written recommendation of the examining physician **shall** be maintained by the Program Coordinator/ Human Resources for the ASM Global facility.
4. The results of the medical evaluation / questionnaire **must** remain in the employees' confidential medical records or at the treating physician's location.

END OF SECTION

DEFINITIONS

The following terminology has specific meaning within the context of ASM Global Best Practices.

May: The word "may," is equivalent to "is permitted," and is used to indicate actions permissible within the limits of the best practices.

Must and Shall: The terms "must" and "shall" are equivalent to "is required to," and are used to indicate mandatory requirements and courses of actions.

Recommended: The word "recommended" indicates flexibility of choice with a strong preference over an alternative.

Should: The word "should" be used to indicate that a certain course of action is preferred, but not required.

DISCLAIMER

In an effort to provide a certain degree of consistency and coverage with regards to ASM Global operational activities at all of its venues, these Best Practices have been developed for your use. These **should** not be considered to provide in every instance complete coverage nor shall these supersede City, County, State, Federal or Manufacturer requirements as applicable.

Scaffolding

Purpose:

TCF Center management has developed a program for scaffold safety to ensure a safe work environment and to protect the health and safety of ASM Global employees. This program is written in accordance with the requirements of Occupational Safety and Health Administration (OSHA) 29 CFR 1926 Subpart L. ASM Global's staff does not assemble any scaffolding if its every needed all work will be contracted out.

Scope:

This policy pertains to all ASM Global employees and establishes safety requirements for the proper construction, inspection, maintenance, operation, and use of scaffolds at TCF Center

Policy:

All scaffolds used in construction, renovation, repair (including painting and decorating), and demolition shall be erected, dismantled, and maintained in accordance with this program.

4.0 Authority and Responsibility:

Director of Operations:

1. Reviewing this program to ensure compliance with current regulations.
2. Reporting any questionable conditions that are discovered to the responsible department; and
3. Ensuring all affected employees are trained in accordance with this program.
4. Ensuring all affected employees follow the prescribed practices within this program.
5. Designating a competent person.
6. Designating a qualified person to design and supervise during the erection, use and disassembling of scaffolding; and
7. Ensuring all inspection.

Employees affected by this program are responsible for complying with the practices within the Scaffolding Program.

The competent person shall be trained in accordance with the Occupational Safety and Health Administration and responsible for:

1. Directing employees who erect, dismantle, move, or alter scaffolding.
2. Determining if it is safe for employees to work from a scaffold during storms or high winds, and ensure that a personal fall arrest system is in place; Training employees involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolding to recognize associated work hazards;
4. Inspecting scaffolds and scaffold components for visible defects before each work shift, and after any occurrence which could affect the structural integrity, and to authorize prompt corrective action.
5. Inspecting ropes on suspended scaffolds prior to each work shift and after every occurrence which could affect the structural integrity, and to authorize prompt corrective actions.
6. For suspension scaffolds, evaluating direct connections to support the load to be imposed.
7. For erectors and dismantler's, determining the feasibility and safety of providing fall protection and access; and

8. For scaffold components:
a. Determining if a scaffold will be structurally sound when intermixing components from different manufacturer's; and
b. Determining if galvanic action has affected the capacity when using components of dissimilar metals.

Qualified persons shall be responsible for:

1. Designing and loading scaffolds in accordance with design specifications.
2. Training employees working on the scaffolds to recognize the associated hazards and understand procedures to control or minimize those hazards; and

3. For suspension scaffolds:
a. Designing platforms on two-point adjustable suspension types that are less than 36 inches wide to prevent instability.
b. Making swaged attachments and spliced eyes on wire suspension ropes; and
c. Designing components in accordance with design specifications.

Competent Person

Jobs that require employees to use scaffolds must designate a “competent person” to oversee erecting, securing, and dismantling of scaffolds. The competent person must understand the rules, and regulations as they pertain to the scaffold, he/she oversees, as well as conduct scaffold inspections and manage daily activities involving scaffold use. The “competent person” will be appointed by the Director of Operations.

General Requirements for Scaffolds:

Capacity/Loads

Each scaffold and scaffold component shall be capable of supporting, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it. Scaffolds shall be designed by a qualified person and shall be constructed and loaded in accordance the Occupational Safety and Health Administration (OSHA) 29 CFR 1926.451 "General Requirements for Scaffolds” and 29 CFR 1926.452 "Additional Requirements Applicable to Specific Types of Scaffolds". Stationary scaffolds over 125 feet in height and rolling scaffolds over 60 feet in height shall be designed by a professional engineer. All equipment shall be inspected to see that it is in good condition and is serviceable. Damaged or deteriorated equipment shall not be used.

Platforms

Each platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and the guardrail supports as follows.

• Platforms shall be entirely planked and decked with space not more than one inch wide between the platforms and uprights.
• The platform shall not deflect more than 1/60 of the span when loaded.
• All platforms shall be kept clear of debris or other obstructions that may hinder the working clearance on the platform.
• Wood planks shall be inspected to see that there are graded for scaffold use, are sound and in good condition, straight grained, free from saw cuts, splits, and holes.
• Platforms and walkways shall be at least 18 inches in width. When the work area is less than 18 inches wide, guardrails and/or personal fall arrest systems shall be used.
• Where platforms are overlapped to create a long platform, the overlap shall occur only over supports, and shall not be less than 12 inches unless the platforms are nailed.
• The front edge of all platforms shall not be more than fourteen inches from the face of the work unless guardrail systems are erected along the front edge and/or personal fall arrest systems are used.
• A platform greater than 10 feet in length shall not extend over its support more than 18 inches, unless it is designed and installed so that the cantilevered portion of the platform is able to support employees without tipping, or has guardrails which block employee access to the cantilevered end;
• Wood surface shall not be covered with opaque finishes, other than the edges for making identification.

• Platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; however, the coating shall not obscure the top or bottom wood surfaces; and
• Each end of the platform, unless cleated or otherwise restrained by hooks or equivalent means, shall extend over the centerline of its support at least six inches. Scaffold components manufactured by different manufacturers shall not be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained. Scaffold components made of dissimilar metals shall not be used together unless a competent person has determined that galvanic action will not reduce the strength of any component.

Criteria for Support Scaffolds

Supported scaffolds are platforms supported by legs, outriggers beams, brackets, poles, uprights, posts, frames, or similar rigid support. The structural members, poles, legs, posts, frames, and uprights must be plumb and braced to prevent swaying and displacement. Supported scaffolds with a height to base width ratio of more than 4:1 must be restrained by guying, tying, bracing or an equivalent means.

The following placements must be used for guys, ties, and braces.

• Install guys, ties, or braces at the closest horizontal member to the 4:1 height and repeat vertically with the top restraint no further than 4:1 height from the top.
• Vertically – every 20 feet or less for scaffolds less than three feet wide and every twenty-six feet or less for scaffolds more than three feet wide; and
• Horizontally – at each end; at intervals not to exceed 30 feet from one end.
Supported scaffold poles, legs, posts, frames, and uprights shall bear on base plates and mud sills or other adequate firm foundation and shall include the following.
• Footings shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
• Unstable objects shall not be used to support working platforms.
• Front-end loaders and similar pieces of equipment shall not be used to support scaffold platforms unless they have been specifically designed by the manufacturer for such use; and
• Fork-lifts shall not be used to support scaffold platforms unless the entire platform is attached to the fork and the fork-lift is not moved horizontally while the platform is occupied.

Supported scaffold poles, legs, posts, frames, and uprights shall be plumb and braced to prevent swaying and displacement.

Access Requirements

Access shall be provided when scaffold platforms are more than 24 inches above or below the point of access. Direct access is acceptable when the scaffold is not more than 14 inches horizontally and not more than 24 inches vertically from the other surfaces. Crossbraces shall not be used as a means of access.
Type of accesses which are permitted:

• Portable ladders tied off to the structure.
• Hook-on ladders.
• Attachable ladders
• Stairways.
• Stair towers.
• Ramps and walkways; or

• Integral prefabricated frames.

When erecting or dismantling supported scaffolds, a safe means of access shall be provided when a competent person has determined the feasibility and analyzed the site conditions.

Use Requirements

The use of shore scaffolds and lean-to-scaffolds is strictly prohibited. All employees are prohibited from working on scaffolds covered with snow, ice, or other slippery materials. Work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for employees to be on the scaffold and those employees are protected by a personal fall arrest system or a wind screen. Scaffold and scaffold components shall be inspected for visible defects by a competent person before each work shift, and after any occurrence with could affect a scaffold's structural integrity. Any part of a scaffold damaged or weakened such that its strength is less than that required in the section 1926.451(a) shall be immediately repaired or replaced, braced to meet those provisions, or removed from service until repaired. Scaffolds shall not be moved horizontally while employees are on them, unless they have been designed by a registered professional engineer specifically for such movement, or for mobile scaffolds

Clearance Distances between Scaffolds and Powerlines

The following table provides the clearance distances between scaffolds and powerlines, or any other conductive material, while being erected, used, dismantled, altered, or moved**.**

Table 1

Insulated Lines Voltage	**Minimum Distance**	**Alternative**
Less than 300 volts 300 to 50 kv More than 50 kv	3 feet 10 feet 10 feet General Rule: 0.1 inches for each 1 kv over 50 kv	Two times the length of the line insulator, but never less than 10 feet
Uninsulated Lines Voltage	**Minimum Distance**	**Alternative**
Less than 50 kv More than 50 kv	3 feet 10 feet 10 feet General Rule: 0.1 inches for each 1 kv over 50 kv	Two times the length of the line insulator, but never less than 10 feet

EXCEPTION: Scaffolds and materials may be closer to power lines than specified where such clearance is necessary for performance of work and only after the utility company or electrical system operator has de-energized or relocated the lines.

Fall Protection and Guardrails:

Fall protection includes guardrail systems and personal fall arrest systems. Fall Protection Personal fall arrest systems include harnesses, components of the harness/belt such as Dee-rings, and snap hooks, lifelines, and anchorage point. Employees working on scaffolds ten (10) feet or more above ground/floor level shall use fall protection in accordance with ASM Global's Fall Protection Program.

Guardrails:

All scaffolds more than six feet above the lower level shall protect employees with guardrails on each open side of the scaffold. Guardrails shall be installed along the open sides and ends before releasing the scaffold for use by the employees, other than erection or dismantling crews. Refer to Appendix A of the OSHA Standard 1925.451 for specific requirements for the construction of guardrails.

Guardrails are not required when:

• The front end of all platforms are less than 14 inches from the face of the work; and
• When employees are plastering and lathing 18 inches or less from the front edge. Materials such as steel or plastic banding shall not be used for toprails or midrails.

The following chart illustrates the type of fall protection required for specific scaffolds.

Table 2

Types of Scaffold	Fall Protection Required
Ladder jack scaffold	**Personal fall arrest system**
Needle beam scaffold	**Personal fall arrest system**

Falling Objects:

To protect employees from falling hand tools, debris, and other small objects, install toe boards, screens, guardrail systems, debris nets, catch platforms, canopy structures, or barricades. In addition, each employee must wear a hard hat.

Specific Scaffold Requirements

The following are the requirements for specific types of scaffolds:

• Fabricated frame scaffolds (tubular welded frame scaffolds) - Appendix A.
• Form scaffolds and carpenter's bracket scaffolds - Appendix B.
• Pump jack scaffolds - Appendix C.
• Ladder jack scaffolds - Appendix D.
• Crawling boards (chicken ladders) - Appendix E.
• Two-point adjustable suspension scaffolds - Appendix F.
• Multi-level suspended scaffolds - Appendix G.

• Mobile scaffolds - Appendix H; and
• Aerial lifts - Appendix I.

Training:

All employees who perform work on a scaffold shall be trained annually by a person qualified to recognize the hazards associated with the type of scaffold being used and the procedures to control or minimize those hazards.

Employees who work, erect, dismantle, move, operate, repair, maintain, or inspect scaffolds shall be trained in the following.

• Nature of electrical, fall hazards and falling object hazards in the work area.
• The correct procedures for dealing with electrical hazards.
• Proper use of scaffolds.
• Proper handling of materials on scaffolds.
• Proper erecting, maintaining, and disassembling of fall protection systems.
• Proper construction, use, placement, and care in handling of scaffolds; and
• Maximum intended load and load-carrying capacities of scaffolds used. Employees who are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold shall be trained by a competent person to recognize any hazards associated with the work in question. The training shall include the following topics, as applicable.
• The nature of scaffold hazards.
• The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question; and
• The design criteria, maximum intended load-carrying capacity and intended use of the scaffold.

Retraining:

Retraining shall be conducted when there is reason to believe that the employee lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds.

Retraining is required in at least the following situations.

• Where changes at the worksite present a hazard about which an employee has not been previously trained; or
• Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained; or
• Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.
• Yearly online fail protection training includes section of scaffolding construction and safe use.

Slip Prevention

Background

For falls from elevation, please see the TCF Center "Fall Protection" program. In the context of this program, the word "fall" refers to the falls related to slips and trips.

Responsibility

The implementation of this is the responsibility of ASM Global's Facility Manager and the Safety Manager and Operations Leads.

Slips

Slips occur when there is too little friction or traction between one's feet and the walking surface. The most common causes of slips are wet surfaces, ice or other weather hazards, spills, and poor tread on footwear. Preventive measures include:

- Wet surfaces: Shorten your stride, walk with feet pointed out slightly, and make wider turns.
- Spills: Clean up immediately.
- Weather hazards: Walk more slowly so you can react to traction changes. Wear slip resistant shoes or boots and dry off shoes as soon as practical after entering a building (wet shoes on dry floors are as dangerous as dry shoes on wet floors). Wear sunglasses on sunny winter days so you can more easily see slippery areas.
- Poor tread on footwear, or generally poor traction: Wear slip resistant footwear, apply abrasive strips to smooth walking surfaces, post warnings.

Trips

Trips commonly occur when your foot strikes an object, and your momentum throws you off balance. To minimize the potential for this type of injury:

- Do not allow carried packages to obstruct your view.
- If glasses fog due to atmospheric changes, clear them immediately.
- Use only proven walkways.
- Close desk and file drawers when not in use.
- Report burned out or missing lights.
- Be aware of elevator threshold positions
- report any uneven or broken pavement / sidewalks, loose handrails, unanchored rugs or mat flooring, or other walking surfaces that do not have same degree of traction in all areas wrinkled carpeting
- avoid uncovered cables - tape them down
- avoid bottom drawers not being closed
- avoid uneven (steps, thresholds) walking surfaces

Applicable OSHA Standards to Prevent Slips, Trips, and Falls -- Compliance

1910.141(a)(3)(ii)

The floor of every workroom shall be maintained, so far as practicable, in a dry condition. Where wet processes are used, drainage shall be maintained and false floors, platforms, mats, or other dry standing places shall be provided, where practicable, or appropriate waterproof footgear shall be provided.

1910.176(c)

Housekeeping - Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary

1910.22(a)(1)

All places of employment, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition.

"Floor hole" – DEFINITION - An opening measuring less than 12 inches but more than 1 inch in its least dimension, in any floor, platform, pavement, or yard, through which materials but not persons may fall; such as a belt hole, pipe opening, or slot opening. NOTE: this is not an opening through which someone could fall but it would be large enough to create a **tripping hazard** or have tools fall through.

1910.23(a)(8)

Every floor hole into which persons can accidentally walk shall be guarded by either:

A standard railing with standard toe board on all exposed sides, or a floor hole cover of standard strength and construction. While the cover is not in place, the floor hole shall be constantly attended by someone or shall be protected by a removable standard railing.

1910.23(a)(9)

Every floor hole into which persons cannot accidentally walk (on account of fixed machinery, equipment, or walls) shall be protected by a cover that leaves no openings more than 1 inch wide. The cover shall be securely held in place to prevent tools or materials from falling through.

Housekeeping

Both slips and trips result from some kind of unintended or unexpected change in the contact between the feet and the ground or walking surface. This shows that good housekeeping, quality of walking surfaces (flooring), selection of proper footwear, and appropriate pace of walking – short steps on wet surfaces) are critical for preventing fall accidents.

Good housekeeping is the **first and the most important (fundamental)** level of preventing falls due to slips and trips. GOOD HOUSKEEPING includes:

- cleaning all spills immediately
- marking and isolating spills and wet areas
- mopping or sweeping debris from floors
- removing obstacles from walkways and always keeping them free of clutter
- securing (tacking, taping, etc.) mats, rugs and carpets that do not lay flat
- always closing file cabinet or storage drawers
- covering cables that cross walkways
- keeping working areas and walkways well lit
- replacing used light bulbs and faulty switches

Changing or modifying walking surfaces is the next level of preventing slip and trips. Recoating or replacing floors, installing mats, pressure-sensitive abrasive strips, or abrasive-filled paint-on coating and metal or synthetic decking can further improve safety and reduce risk of falling. However, it is critical to remember that high-tech

flooring requires good housekeeping as much as any other flooring. In addition, resilient, non-slippery flooring prevents or reduces foot fatigue and contributes to slip prevention measures.

Water, grease, and other fluids can make walking surfaces slippery. Well-documented housekeeping procedures, correct floor cleaning, proper usage of mats and signs, accessible clean-up materials, and slip-resistant shoes will help to minimize the risk of slipping. ASM Global will use only proven methods and cleaning materials that do not leave a slippery residue.

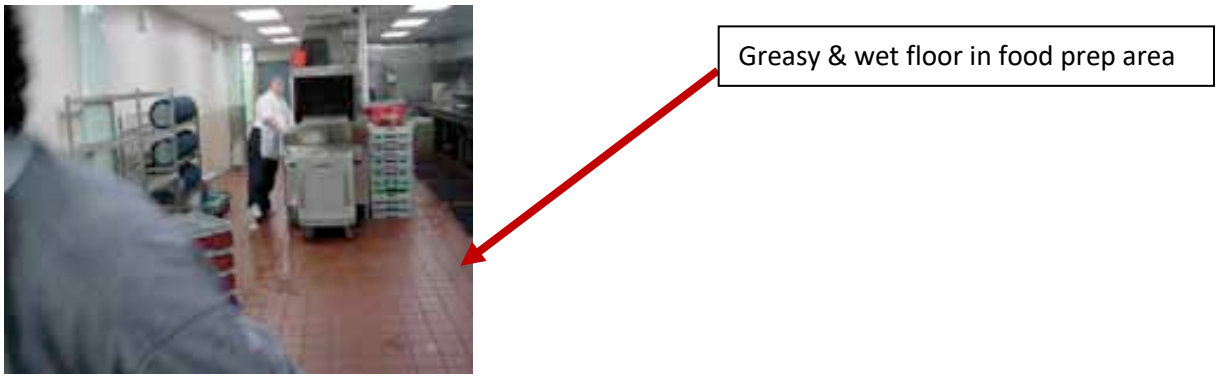
Contractors

Contractors will be held accountable through contract language to ensure that their work does not create slipping or tripping hazards. Any contracted work that will result in wet floors or waste materials that could become tripping hazards will be monitored by ASM Global to identify and eliminated slipping and tripping hazards. Contractors will be held responsible for isolating slipping and tripping hazards until theses hazards are corrected.

Food Services Area

Where does the hazard occur?

Food services areas: kitchen, cafeteria, serving line, buffet, ice machines, freezers, dishwashers, sinks, and drains. Greasy floors are one of the main causes of slippery floors leading to slips and falls Decontamination area: when wet equipment is transferred from one area to another. Soap dispensers, drinking fountains, building entrances, where rain and snow are tracked inside are all areas where slipping hazards are created.



Prevention

Keep floors clean and dry.

- Encourage workers to cover, clean, or report spills promptly.
- Hang or place spill pads, paper towel holders, pop-up-tent wet floor signs in convenient locations throughout the healthcare facility so employees have easy access to products to clean, cover, and highlight a spill.
- Advertise phone/pager numbers for housekeeping through emails, posters, and general awareness campaigns.

- Place water-absorbent walk-off mats where water, ice, or soap may drip onto the floor. Use beveled-edge, flat, and continuous mats.
- Provide walk-off mats, paper towel holders, trash cans, and umbrella bags near entrances and water fountains to minimize wet floors.

Footwear

In workplaces where floors may be oily or wet or where workers spend considerable time outdoors, prevention of fall accidents should focus on selecting proper footwear. Since there is no footwear with anti-slip properties for every condition, consultation with manufacturers' is highly recommended. Slip resistant footwear can be obtained commercially. In areas known to be slippery because of the work being done, slip resistant shoes are a good choice and should be considered.

Properly fitting footwear increases comfort and prevents fatigue which, in turn, improves safety for the employee.

Floor Mats

Mats should be large enough so that several footsteps will take place on the mat; if there is water around or beyond the mat, it means that the mat is not large enough and/or is saturated and needs to be replaced. Secure mats from moving and make sure they have slip-resistant backing. Remind staff to lay mats in the correct position daily and use visual cues such as tape on the floor if necessary.

Proper Cleaning Procedures

Optimal floor cleaning procedures may prevent slips and falls. Research has shown that a two-step mopping process is better than damp-mopping. In the two-step process: 1) cleaning solution is applied on a section of the floor with a dripping mop, then 2) after a few minutes, the cleaning solution is removed with a wrung mop, before the solution dries. Be sure the cleaning product can be used on common floor contaminants. Make sure cleaning products are mixed according to manufacturer’s directions.

Prevent Contacts with Wet Floors

Use highly visible caution signs to inform employees and visitors to be careful and avoid contaminated area. Block off areas during floor cleaning, stripping, and waxing. Use barrier products) or caution tape to prevent employees from entering an area being cleaned or from stepping on a spill. Use a long barrier device if a dry lane must be kept clear for passage. Use barrier devices to prevent water and other fluids from entering hallways when cleaning rooms Use in conjunction with tension bar or other blocking device so the floor barrier does not become a tripping hazard. Remove all signs once the floor is clean and dry, so they do not become commonplace and ignored by staff.

HIGHLIGHT WET FLOORS

Walking with boxes – note how vision is obscured creating a potential tripping hazard

Prevent drainage onto walking surfaces - especially in the winter - to prevent ice buildup.

Indoors - Tripping

What is the hazard?

Damaged, warped, buckled, or uneven flooring, buckled rugs, surfaces can cause employees to stumble, trip, slip, or fall. Even small holes as defined by OSHA (see above) or gouges can create tripping hazards.

Where does the hazard occur?

- Building entrances
- Hallways
- Around drains in the floor
- Floor matting

Prevention Strategies

Replace or re-stretch loose or buckled carpeting. Remove, patch underneath, and replace indented or blistered vinyl tile.

Patch or fill cracks in indoor walkways greater than ¼" wide.

Reduce or eliminate trip hazards over ¼" high in all areas of pedestrian travel. For changes in level ¼" to ½" high, bevel with a slope no greater than 1:2. For heights greater than ½" high consider a ramp create visual cues. Highlight changes in walkway elevation with Safety Yellow warning paint.

Replace smooth flooring materials **in areas normally exposed to water, grease and/or particulate matter** with rougher-surfaced flooring when renovating or replacing healthcare flooring. Make sure elevators are leveled properly so that elevator floors line up evenly with hallway floors.

Outdoors – Tripping

- Entrances
- Change in elevation
- Parking garages and lots
- Walkways
- Around drains in the ground

Prevention

- Patch or fill cracks in walkways greater than ½" wide.
- Patch, fill, or repave outdoor areas that have deep grooves, cracks, or holes.
- Create visual cues. Highlight changes in curb or walkway elevation with Safety Yellow warning paint.
- Concrete wheel stops in parking lots can be a tripping hazard and should not be used.
- Remove stones and debris from walking surfaces.
- Ensure that underground watering system structures are covered or highlighted.

Ice and Snow

Where?

- Entrances
- Parking garages and lots
- Walkways
- Outside stairs
- "Black" ice – clear ice formed over **black asphalt** that is invisible at certain angles.

Prevention Strategies

- Identify and report icy conditions. ASM Global maintains an inventory of commonly used walkways and vestibule areas typically wet or icy during the winter that needs constant maintenance to ensure a slip free walking surface.
- Place labeled bins filled with ice melting chemicals and scoops that anyone can use immediately on icy patches. Consider placing bins in areas of heavy employee/pedestrian traffic such as the top and bottom of outdoor ramp walkways, stairs, and garage entrances/exits.
- Have an aggressive program to promptly remove ice and snow from parking lots, garages, and sidewalks.
- Distribute winter weather warnings via email to staff when ice and snow are predicted. For staff that does not have access to email, provide notices on bulletin boards.
- Place freezing weather warning monitors at entrances to employee parking areas Display phone or pager number for maintenance department via posters and emails to encourage employees to outdoor stairways, parking garage exits and entrances, and healthcare facility entrances. The bins should be labeled with the appropriate Material Safety Data Sheets (MSDS) and include instructions for handling ice melting chemicals. Bins should be secured so they cannot be removed.
- Provide additional mats in entrances during winter months and when it rains.
- Consider slip-resistant footwear **(including ice cleats**) for employees who work or travel outdoors as part of their jobs.

Winter Safety

Keep adequate supplies of snow and ice removal tools in readily accessible areas.

Shovel the snow and salt the ground as often as necessary to keep walking areas clean and dry. Identify and prioritize areas where ice tends to form; remove ice accumulations promptly.

Contract, as necessary, with a snow removal company to keep parking lots clear of snow and ice. (Make sure that the contracted company has workers' compensation insurance).

Limit walking to designated walkways as much as possible. Discourage taking shortcuts over snow piles and in areas where snow and ice removal is not feasible. Appropriate employees should wear shoes or boots that are specifically designed to provide traction on wet, slippery surfaces. Strap-on or slip-on footwear designed for winter weather can be worn for additional protection. Test the travel path for slickness by sliding your shoe/boot on it before proceeding.

Take short steps to maintain your center of balance over your feet. Walk slowly; never run on snow- or ice-covered surfaces. When entering and/or exiting vehicles, use the vehicle for support. Never jump from vehicles or equipment.

When entering a building, remove snow and water from footwear so you do not create wet, slippery conditions indoors. Place high quality, beveled edge mats in walking areas subject to water or snow accumulation. Change mats regularly to ensure those in place are dry and serviceable.

Venue Security

Purpose

The Salt Palace Convention Center (SPCC), South Towne Exposition Center (STEC) and the Equestrian Park Events Center (EPEC) Venue Security & Control Program provides an outline of the steps necessary for creating a venue-specific plan.

Adhere to the general outline is essential for the following reasons:

- Ensure personal safety of all people within both venues
- Ensure protection of both venues' assets

Elements include an event safety plan, evacuation plan, incident reports, site protection measures, surveillance systems, etc. Elements also include visitor procedures, employee check-in, loading dock policies & procedures, contractor check-in, system controls, etc.

References

ASMG Best Practices Safety Management
IAAM Safety & Security Task Force

ASMG Best Practices Narratives:

- 2.1 Emergency Plan
- 2.3 Life Safety
- 2.6 Hazard Communication Program
- Facility-specific SOPs
- Command Center
- Guest Services
- Operations
- Building Services
- Elevator Entrapment Plan (check with service provider for specific details)

Scope, Plan and Elements of the Program Checklist:

- Check whether all the doors are of a sufficiently solid nature and adequately secured against potential threats.
- Check whether all the locks, bolts and other door furniture meet the necessary standards for the level of risk.
- Inspects locks frequently to make ensure that they are in full working order.
- Check whether the locking-up procedure of the premises under the control of competent officials.
- When the external doors of the premises are closed, are the keys removed from the premises or adequately supervised and protected.
- Are the frame structures of the windows fully secure and fitted with quality locks or limiters, and do they meet Security standards.
- Check whether the glass in all windows meets Security standards.

- Check the bars, grilles, and surrounding masonry regularly for weakness and deterioration.
- Install an Electronic Access Control System.

Contractor Check-in

All Contractors must:

- Notify the Security Office at the beginning of each shift.
- Report how many people will be working on site and deliver a written inventory for any tools and equipment that will remain on site overnight.
- A report expected work schedule and potential hazards / area restrictions created during the project.
- The facility supervisor will give authorization for the visit and direct the contractor to the Security Office to obtain the appropriate ID or paperwork.
- Fill out Contractor Safety Checklist

Elevator Entrapment Procedures:

- Do not try and force the doors open.
- Follow instructions provided by a service provider that pertain to the specific make and model of elevator in question.

Temporary Employee Check-in Temporary

employees must:

- Report for shifts at the Security Office unless otherwise designated to do so.
- Be accompanied by a supervisor while in the venue during non-shift hours.
- Report to work no more than 30 minutes prior to shift.

Emergency Evacuation Plan

The Security Office must develop and maintain an updated venue specific Emergency Evacuation plan that includes training for all employees.

- Evacuation route Signage must comply with local codes.
- All fire exits should be marked and kept unlocked and accessible at all times while the building is open to the public.
- The venue must have a floor plan for each floor in the common view of public education that includes all exit routes, doors, and meeting points along the venue premise.
- Where applicable in existing buildings, all door handles, and control devices should meet the standards of the Americans with Disabilities Act or relevant country standards.

Event Safety Plan

- Set-up and pre-event checklists, including checking all seats and installations for damage must be utilized for all events.
- Maintain all exits and aisles free from obstruction.
- Test emergency systems as needed or prior to each event and follow through on Operation Pre-event checklists of Floor Plans.

- Each venue will have a floor plan on file with the Operations Department.

Floor plans shall show:

- General layout of the venue and exit routes.
- Interior walls and partitions.
- Exterior doors, entrance ways.
- Exterior doors, fire escapes.
- Exterior windows.
- Interior windows and passages.
- Interior doors.
- Purpose or function of each room.
- Fire extinguishers.
- Each venue floor plan must be added to this manual in the appendix section and reviewed and updated annually for changes or modifications.

INCIDENT REPORTING

- Employees must file a Damage and/or Missing Items Report for all incidents.
- If the Police Department is also called, the Security Officer taking the report will add the Police Department Case number to the venue incident report if applicable.
- Lost or stolen items must be reported to the Security Office.
- Security Office Staff must ensure that the proper report is filled out after each incident.
- Each venue is secured by a departmental issued key with hardware installed, maintained, and replaced by work order through the Security Department Key System and Servicing of Facilities.
- Keys shall be issued at the discretion of the appropriate Department Director to employees of the Department.
- Employees that are issued keys should be responsible for the signing out of the key through the immediate supervisor of the employee orientation checklist.
- Should their key be lost, misplaced, or stolen, the employee shall notify their supervisor immediately.
- Each venue should be secured and locked upon closing of the venue, whether it be for overnight or for a period of time during normal operating hours when the venue will not be staffed or supervised.
- Interior doors should be secured and locked upon closing of the venue.
- Windows and passageways should be secured and locked upon closing of the venue.
- Building Security should be checked each evening by the site supervisor who will assure the locking of doors and Security of the building.
- In the event a door, window or passageway does not lock or is unable to be secured, the employee shall notify their supervisor immediately and remain at the venue until the situation is corrected.
- No key may be duplicated by any employee unless given express written consent of the General Manager.
- Keys should only be issued by the direction of the Department Director.

- Any group or individual renting or leasing a venue may not be issued a key unless authorized by management. A staff employee should be assigned to oversee the venue area in use during this time.
- Master keys will be issued by order of the Director of Operations.
- For Security reasons, a list of those persons in possession of a master key should be on file in the Security Office.
- Upon leaving employment, an employee should return any issued keys to the Department. The Exit Form Checklist will assure the submission of the keys.

DOCK SAFETY RULES AND REGULATIONS

OSHA 29 CFR 1910.178, 1910.176, 1910.22

- Before entrance or any work is initiated at this facility, please check in with the Security Department by calling # 385-468-2220.
- Badges or alternate identification must be worn and visible at all times by all Exhibitors, Contractors, and their Associates. NO EXCEPTIONS.
- Absolutely NO PARKING in designated Fire Lanes or Access Lanes. The Emergency Lanes MUST be kept clear and maintained at all times.
- All empty crates and pallets must be stored in Authorized Storage Areas ONLY or off the dock area.
- Use of facility equipment by Unauthorized Personnel for Load In / Out is strictly prohibited.
- The use of Tape, Blocks, Chairs, or any other items to prop doors open is prohibited.
- The use of Masking Tape, Duct Tape or Foam Tape is prohibited on any floor surface in the facility. *Acceptable products include: A/V Tape, Double-Sided Carpet Tape and Gaffers Tape.
- All damage and or accidents are to be reported immediately to the Security Office.
- Smoking ONLY allowed in designated smoking areas or 25 feet from any doorway.
- Please obey ALL Fire Safety Rules during the setup of exhibits. A copy of the facility Fire Safety Rules is available in the Security Office.
- Wheel chocks MUST be utilized and placed by the driver for any Trailer parked or stored in the dock area.
- ALL Trailers must have ONE Traffic Cone placed on the ground in front of the Trailer while loading or unloading is taking place. Traffic Cones will be placed into position by the DRIVER dropping the Trailer. The Trailer WILL NOT be picked up until the Trailer and load are inspected by the DRIVER for travel, at which time, the Traffic Cone and Wheel Chocks will be removed to prepare the Trailer for transport.
- All Forklifts will drive in a safe and prudent manner. OSHA rules for Loading Dock Safety will be enforced.
- Please drive Low and Slow. Watch for Pedestrians and be careful.

These Rules are in place for the Safety of all Attendees to this facility. Strict compliance with these rules is requested. Noncompliance of the Rules and Regulations for Dock Safety as listed, the Attendee will be asked to leave until compliance to these Safety Rules can be willfully satisfied.

Review

- The ASMG Salt Lake Venue Security & Control Program should be reviewed annually with any modifications, changes, or additions to be made.
- Floor plans should be reviewed annually to assure any modification, change or new area are included.

Site Protection Measures

- All venues must maintain strict control of the perimeter access points.
- Access to the venue premise must be designed to direct movement through the desired areas.

Storage of freight and receiving policy

- The Security Office or other listed specific department staff will be in charge of the reception of all items delivered to the loading dock.
- The venue must not receive any item designated for an event that has already happened.
- The storage of materials and equipment must never impede operating space, workshops, offices, electrical or telephone closets, storage rooms, stairwells, Security cameras, exit doors and dock levers.
- Freight containers should be stored in trucks/vehicles whenever possible.
- Service providers must store their freight containers on the outside loading dock.

Surveillance Systems

- Each venue must operate a surveillance system within the physical and practical boundaries that includes video cameras as well as regular walking rounds and inspections. ▪ Video cameras should record the movement at all entrances and exits whenever possible.
- Surveillance logs and recorded images must be kept in accordance with the Security Office SOP

Systems Control

- Access to the automated system controls must be restricted to only the most trustworthy and capable employees.
- Each user must have their own log in account and is not permitted to log-in using another user's information, contractors and guests must be given individual log-in accounts when applicable.
- Accurate user logs must be maintained to provide an accurate history of use.

- Physical access i.e. keys to venue systems must be restricted to only those employees who need access to the systems.
- Whenever possible access to the venue's physical systems must be restricted by locks, doors, walls, fencing and accompanied by the proper Signage.

Training

- The ASMG Salt Lake Venue Security & Control Program should be an integral part of the new employee and in-house training program of the Department.
- All employees should be oriented to this plan as part of their training program.
- All training should be documented with dates, topics discussed, and attendance.

Visitor Procedures

- Visitors, guests, and off duty part-time employees must use the main lobby entrance.
- All persons entering the venues and need access to the administration offices must be accompanied by a full-time venue employee.
- The Security Office will issue all visitor passes.

Welding, Cutting, Brazing

PURPOSE

This program covers OSHA requirements for the general use of compressed gases including oxygen and fuel gas and arc welding used at TCF Center to perform welding or cutting.

RESPONSIBILITY

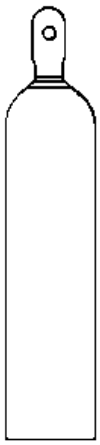
The Facilities Manager has overall responsibility to ensure that the following safety requirements are implemented. All cutting or welding in or around the facility requires a burn permit, **before** proceeding with the work. As part of the permit, a fire watch must be instituted and maned by the employees or contractors that are performing the work. Burn permits are acquired from control room security.

COMPRESSED GAS CYLINDERS

- Valve protection caps shall be in place and secured.
- When cylinders are hoisted, they shall be secured on a cradle, slingboard, or pallet. They shall not be hoisted or transported by means of magnets or choker slings.

- Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dropped, struck, or permitted to strike each other violently.

- When cylinders are transported by powered vehicles, they shall be secured in a vertical position.



- Valve protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve protection caps to pry cylinders loose when frozen. Warm, not boiling, water shall be used to thaw cylinders loose.

- Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed, and valve protection caps put in place before cylinders are moved.

- A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.

- When work is finished, when cylinders are empty, or when cylinders are moved at any time, the cylinder valve shall be closed.

- Compressed gas cylinders shall be secured in an upright position at all times, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

- Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet (6.1 m) or by a noncombustible barrier at least 5 feet (1.5 m) high having a fire-resistance rating of at least one-half hour.

- Inside of buildings, cylinders shall be stored in a well-protected, well-ventilated, dry location, at least 20 feet (6.1 m) from highly combustible materials such as oil or excelsior. cylinders should be stored in definitely assigned places away from elevators, stairs, or gangways. Assigned storage places shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering.

- The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tank cars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965.

Placing Cylinders

- Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields shall be provided.

- Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

- Fuel gas cylinders shall be placed with **valve end up** whenever they are in use. They shall not be placed in a location where they would not be subject to open flame, hot metal, or other sources of artificial heat.

- Cylinders containing oxygen or acetylene, or other fuel gas shall not be taken into confined spaces.

Treatment of Cylinders

- Cylinders, whether full or empty, shall not be used as rollers or supports.

- No person other than the gas supplier shall attempt to mix gases in a cylinder. No one except the owner of the cylinder, or person authorized by that person, shall refill a cylinder. No one shall use a cylinder's contents for purposes than those intended by the supplier.

- No damaged or defective cylinder shall be used.
- Cylinders, cylinder valves, couplings, regulators, hose, and apparatus shall be kept free from oily or greasy substances. Oxygen cylinders or apparatus shall not be handled with oily hands or gloves. A jet of oxygen must never be permitted to strike an oily surface, greasy clothes, or enter a fuel oil or other storage tank.

- When transporting cylinders by a crane or derrick, a cradle, boat, or suitable platform shall be used. Slings or electric magnets shall not be used for this purpose. Valve-protection caps, where cylinder is designed to accept a cap, shall always be in place.

- Cylinders shall not be dropped or struck or permitted to strike each other violently.

- Valve-protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve-protection caps to pry cylinders loose when frozen to the ground or otherwise fixed; the use of warm (not boiling) water is recommended. Valve-protection caps are designed to protect cylinder valves from damage.

- Unless cylinders are secured on a special truck, regulators shall be removed and valve-protection caps, when provided for, shall be put in place before cylinders are moved.

- Cylinders not having fixed hand wheels shall have keys, handles, or nonadjustable wrenches on valve stems while these cylinders are in service. In multiple cylinder installations only one key or handle is required for each manifold.

- Cylinder valves shall be closed before moving cylinders.

- Cylinder valves shall be closed when work is finished.

- Valves of empty cylinders shall be closed.

- Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them, or fire-resistant shields shall be provided.

- Cylinders shall not be placed where they might become part of an electric circuit. Contacts with third rails, trolley wires, etc., shall be avoided. Cylinders shall be kept away from radiators, piping systems, layout tables, etc., that may be used for grounding electric circuits such as for arc welding machines. Any practice such as the tapping of an electrode against a cylinder to strike an arc shall be prohibited.

- Cylinders shall never be used as rollers or supports, whether full or empty.
- The numbers and markings stamped into cylinders shall not be tampered with.

- No person, other than the gas supplier, shall attempt to mix gases in a cylinder. No one, except the owner of the cylinder or person authorized by him, shall refill a cylinder.

- No one shall tamper with safety devices in cylinders or valves.

- Cylinders shall not be dropped or otherwise roughly handled.

- Unless connected to a manifold, oxygen from a cylinder shall not be used without first attaching an oxygen regulator to the cylinder valve. Before connecting the regulator to the cylinder valve, the valve shall be opened slightly for an instant and then closed. Always stand to one side of the outlet when opening the cylinder valve.

- A hammer or wrench shall not be used to open cylinder valves. If valves cannot be opened by hand, the supplier shall be notified.

- Cylinder valves shall not be tampered with nor should any attempt be made to repair them. If trouble is experienced, the supplier should be sent a report promptly indicating the character of the trouble and the cylinder's serial number. Supplier's instructions as to its disposition shall be followed.

- Complete removal of the stem from a diaphragm-type cylinder valve shall be avoided.

- Fuel-gas cylinders shall be placed with valve end up whenever they are in use. Liquefied gases shall be stored and shipped with the valve end up.

- Cylinders shall be handled carefully. Rough handling, knocks, or falls are liable to damage the cylinder, valve or safety devices and cause leakage.

- Nothing shall be placed on top of an acetylene cylinder when in use which may damage the safety device or interfere with the quick closing of the valve.

- If cylinders are found to have leaky valves or fittings which cannot be stopped by closing of the valve, the cylinders shall be taken outdoors away from sources of ignition and slowly emptied.

- A warning should be placed near cylinders having leaking fuse plugs or other leaking safety devices not to approach them with a lighted cigarette or other source of ignition. Such cylinders should be plainly tagged; the supplier should be promptly notified, and his instructions followed as to their return.

- Safety devices shall not be tampered with.

- The cylinder valve shall always be opened slowly.

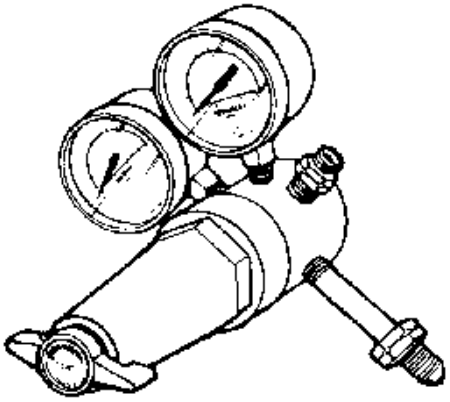
- An acetylene cylinder valve shall not be opened more than one and one-half turns of the spindle, and preferably no more than three-fourths of a turn.

- Where a special wrench is required it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel-gas flow can be quickly turned off in case of emergency. In the case of manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use.

- CYLINDERS MUST BE SECURED BY CHAINS WHEN IN STORAGE WITH CAPS ON AND HAND TIGHTENED

All employees who handle compressed gas cylinders will review this video:
http://www.youtube.com/watch?v=X7hOIsBZTPE

Use of Fuel Gas

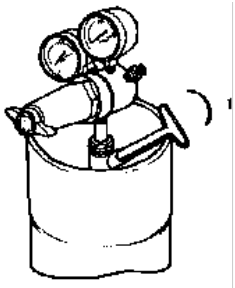


TCF Center's Facility Manager shall thoroughly instruct employees in the safe use of fuel gas, as follows:

- Fuel gas shall not be used from cylinders through torches or other devices which are equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

- Before a regulator to a cylinder valve is connected, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand to one side of the outlet, not in front of it. The valve of a fuel gas cylinder shall not be cracked where the gas would reach welding work, sparks, flame, or other possible sources of ignition.

- The cylinder valve shall always be opened slowly to prevent damage to the regulator. For quick closing, valves of fuel gas cylinders shall not be opened more than 1= turns. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas flow can be shut off quickly in case of an emergency. In the case of manifolded or coupled cylinders, at least one such wrench shall always be available for immediate use. Nothing shall be placed on top of a fuel gas cylinder, when in use, which may damage the safety device or interfere with the quick closing of the valve.



FOR QUCK SHUT OFF
Cylinder valve wrenches should be left in place on cylinders that do not have a hand wheel.

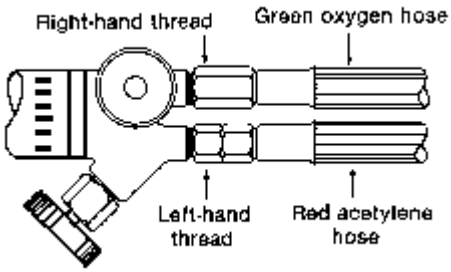
- Before a regulator is , the cylinder valve shall always be closed, and the gas released from the regulator.

- If, when the valve on a fuel gas cylinder is opened, there is found to be a leak around the valve stem, the valve shall be closed, and the gland nut tightened. If this action does not stop the leak, the use of the cylinder shall be discontinued, and it shall be properly tagged and removed from the work area. In the event that fuel gas should leak from the cylinder valve, rather than from the valve stem, and the gas cannot be shut off, the cylinder shall be properly tagged and removed from the work area. If a regulator attached to a cylinder valve will effectively stop a leak through the valve seat, the cylinder need not be removed from the work area.

- If a leak should develop at a fuse plug or other safety device, the cylinder shall be removed from the work area.

Hose

Fuel gas and oxygen hose shall be easily distinguishable from each other. The contrast may be made by different colors or by surface characteristics readily distinguishable by the sense of touch. Oxygen and fuel gas hoses shall not be interchangeable. (See accompanying figure for example). A single hose having more than one gas passage shall not be used.



When parallel sections of oxygen and fuel gas hose are taped together, not more than 4 inches out of 12 inches shall be covered by tape.

All hose in use, carrying acetylene, oxygen, natural or manufactured fuel gas, or any gas or substance which may ignite or enter into combustion, or be in any way harmful to employees, shall be inspected at the beginning of each working shift. Defective hose shall be removed from service.

Hose which has been subject to flashback, or which shows evidence of severe wear or damage, shall be tested to twice the normal pressure to which it is subject, but in no case less than 300psi. Defective hose, or hose in doubtful condition, shall not be used.

Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.

Boxes used for the storage of gas hose shall be ventilated.

Hoses, cables, and other equipment shall be kept clear of passageways, ladders, and stairs.

Torches

- Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.

  Torches in use shall be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used.

Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

TORCHES SHALL BE **FITTED WITH FLASH BACK / CHECK VALVE COMBINATIONS** TO PREVENT REVERSE GAS FLOW INTO TANKS AND DANGEROUS FLASH BACK INT O TANKS.

SAFETY TIPS FOR TORCHES

Gas Pressure: One cause of fires and explosions is high acetylene pressure. When more than 15 pounds of pressure is used, acetylene becomes unstable and decomposes explosively. This is the major reason for using other fuel gases such as MAPP, propylene, propane, and natural gas which may be safely used at higher operating pressures.

Burn back: If your oxygen cylinder is low or empty, reverse flow of gas may occur. The fuel gas, being at a higher pressure, can travel up the oxygen line and mix with gas in the hose, regulator, and cylinder. If you light your torch without purging the lines, a *burn back* may occur with explosions in the hose, regulator, or cylinder.

Backfire: The same thing can happen with high oxygen pressure and low fuel gas pressure if a backfire occurs, which is usually caused by holding the cutting torch too close to your work. This causes gas starvation of the cutting flame and results in the flame being sucked into the torch head. Usually you will hear a popping sound that turns to a whistle when this happens.

Flashback: When a backfire takes place in a mixing chamber, unless you shut off the oxygen valve, the flame burning in the torch head may ignite gases in the hoses and result in a flashback. A flashback is an *explosion* that progresses through the torch, hoses, regulators, and into the cylinders. Consequence can range from a burst hose to a violent explosion of the regulator and cylinders.

Ways to prevent flashbacks, fires, and explosions:

- If using acetylene, keep the pressure below 15 pounds.
- Purge your hoses before lighting the torch.
- Never light your torch with a mixture of fuel and oxygen. After purging the lines, light the torch with only the fuel gas valve open.
- Check valves should be installed on both torch inlets and operating properly. Check valves can stop the reverse flow of gases but will <u>not</u> prevent flashbacks.
- To prevent flashbacks, flashback arrestors must be installed on the outlets of both regulators, and/or torch inlets.

Before welding, take time to inspect the equipment you will be using to be sure check valves and flashback arrestors have been installed. This precaution can prevent a deadly cylinder explosion.

Regulators and Gauges

Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use. DO NOT USE A REGULATOR THAT HAS A DEFECTIVE PRESSURE GUAGE.

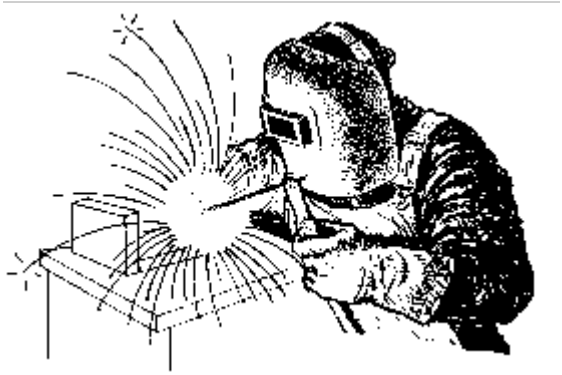
Oil and Grease Hazards

Oxygen cylinders and fittings shall be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled with oily hands or gloves. Oxygen shall not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

Manual Electrode Holders

Only manual electrode holders which are specifically designed for arc welding and cutting, and are of a capacity capable of safely handling the maximum rated current required by the electrodes, shall be used.

Any current-carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.



Welding Cables and Connectors

All arc welding and cutting cables shall be of the completely, insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working.

Only cable free from repair or splices for a minimum distance of 10 feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

Cables in need of repair shall not be used. When a cable, other than the cable lead referred to above, becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tape or other equivalent insulation.

When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are affected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated.

Ground Returns and Machine Grounding

A ground return cable shall have a safe current-carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which its services. When a single ground return cable services more than one unit, its safe current-carrying shall exceed the total specified maximum output capacities of the all the units which it services.

Pipelines containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return.

When a structure or pipeline is employed as a ground return circuit, it shall be determined that the required electrical contact exists at all joints. The generation of an arc, sparks, or heat at any point shall cause rejection of the structures as a ground circuit.

When a structure or pipeline is continuously employed as a ground return circuit, all joints shall be bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

Operating Instructions

The Facility Manager shall instruct employees in the safe means of arc welding and cutting as follows:

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

- Hot electrode holders shall not be dipped in water; to do so may expose the arc welder or cutter to electric shock.

- When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

- Any faulty or defective equipment shall be reported to the HVAC Foreman.

- A disconnecting means shall be provided in the supply circuit for each motor generated arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.

- A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means shall not be less than the supply conductor ampacity.
- Use well insulated electrode holders and cables.
- The electrode holder, or stinger, should be in good condition with no cracks or missing insulation.
- Never leave the welding electrode in the electrode holder, or stinger, when not attending the work.
- Make sure welding cables are dry and free of grease and oil.
- Keep welding cables away from power supply cables.
- Wear dry hole-free gloves AND dry clothing
- Insulate the welder from the ground by using dry insulation, such as a rubber mat or dry wood boards.
- Ground frames of welding units.
- Never change electrodes with bare hands or wet gloves.

Shielding

Whenever practicable, all arc welding and cutting operations shall be shielded by noncombustible or flameproof screen which will protect employees and other persons working in the vicinity from the direct rays of the arc.

When practical, objects to be welded, cut, or heated shall be moved to a designated safe location or, if these objects cannot be readily moved, all movable fire hazards in the vicinity shall be taken to a safe place, or otherwise protected. If these objects cannot be moved and if all the fire hazards cannot be removed, positive means shall be taken to confine the heat, sparks, and slag, and to protect the immovable fire hazards from them.

No welding, cutting or heating shall be done where the application of flammable paints, or the presence of other flammable compounds, or heavy dust concentrations creates a hazard.

Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state or readiness for instant use by properly trained personnel.

When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed, and for a sufficient period of time after completion of the work to ensure that no possibility of fire exists. Such personnel shall be instructed as to the specific anticipated fire hazards and how the firefighting equipment provided is to be used.

When welding, cutting, or heating is performed on walls, floors, and ceilings, since direct penetration of sparks or

heat transfer may introduce a fire hazard to an adjacent area, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed.

ASM Global employees will **NEVER WELD OR CUT** drums, containers, or hollow structures which contain or **have contained** toxic or flammable substances.

Inert-Gas Metal-Arc Welding

Since the inert-gas metal-arc welding process involves the production of ultra-violet radiation of intensities of 5 to 30 times that produced during shielded metal-arc welding, the decomposition of chlorinated solvents by ultraviolet rays, and the liberation of toxic fumes and gases, employees shall not be permitted to engage in, or be exposed to the process until the following special precautions have been taken:

- The use of chlorinated solvents shall be kept at least 200 feet, unless shielded, from the exposed arc, and surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is permitted on such surfaces.
- Employees in the area not protected from the arc by screening shall be protected by suitable filter lenses. Hand shields to protect the welder against flashes and radiant energy shall be used when either the helmet is lifted, or the shield is removed.
- Welders and other employees who are exposed to radiation shall be suitably protected so that the skin is covered completely to prevent burns and other damage by ultraviolet rays. Welding helmets and hand shields shall be free of leaks and openings, and highly reflective surfaces.

General Welding, Cutting, and Heating

Employees performing any type of welding, cutting, or heating shall be protected by suitable eye protective equipment in accordance with the type of work being performed. The following is a guide for the selection of the proper shade numbers. These recommendations may be varied to suit the individual's needs. The objective is to pick a shade that is dark enough to protect the retina and but light enough to allow enough visibility to safely perform the work.

Welding operation	Shade No.
Shielded metal-arc welding - 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	10
Gas-shielded arc welding (nonferrous) - 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	11
Gas-shielded arc welding (ferrous) - 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	12
Shielded metal-arc welding: 3/16-, 7/32-, 1/4-inch electrodes	12

5/16 –, 3/8–inch electrodes	14
Atomic hydrogen welding	10–14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, 6 inches and over	5 or 6
Gas welding (light) up to 1/8 inch	4 or 5
Gas welding (medium) 1/8 inch to 1/2 inch	5 or 6
Gas welding (heavy) 1/2 inch and over	6 or 8

NOTE: In gas welding or oxygen cutting where the torch produces a high yellow light, it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation.

NOTE: This section supplements ASM Global's Fire Prevention Program for those issues related specifically to welding and cutting. Any HVAC mechanic that would be involved in a fire watch must also have the requisite training with portable fire extinguishers.

Basic precautions.

Fire hazards. If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity shall be taken to a safe place.

Guards. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.

Combustible material. Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions shall be taken so that no readily combustible materials on the floor below will be exposed to sparks which might drop through the floor. The same precautions shall be observed with regard to cracks or holes in walls, open doorways and open or broken windows.

Fire extinguishers. Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use.

Fire prevention precautions. Cutting or welding shall be permitted only in areas that are or have been made fire safe. When work cannot be moved practically, as in most construction work, the area shall be made safe by removing combustibles or protecting combustibles from ignition sources.

Fire watch.

Fire watchers shall be required whenever welding or cutting is performed in locations where a fire might develop, or any of the following conditions exist:

- Appreciable combustible material, in building construction or contents, closer than 35 feet to the point of operation.

- Appreciable combustibles are more than 35 feet (10.7 m) away but are easily ignited by sparks.

- Wall or floor openings within a 35-foot (10.7 m) radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

- Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

- Fire watchers shall have fire extinguishing equipment readily available and be trained in its use. They shall be familiar with facilities for sounding an alarm in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch shall be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

Authorization. Before cutting or welding is permitted, the area shall be inspected by the individual responsible for authorizing cutting and welding operations – the HVAC Foreman. He shall designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit. ANY JOB REQUIRING A FIRE WATCH SHALL BE AUTHRORIZED BY BOTH THE HVAC FOREMAN AND THE SAFETY DIRECTOR.

Floors. Where combustible materials such as paper clippings, wood shavings, or textile fibers are on the floor, the floor shall be swept clean for a radius of 35 feet (10.7 m). Combustible floors shall be kept wet, covered with damp sand, or protected by fire-resistant shields. Where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock.

Prohibited areas. Cutting or welding shall not be permitted in the following situations:

- In areas not authorized by the HVAC Foreman or the Safety Director.
- In sprinklered buildings while such protection is impaired.

Relocation of combustibles.

- Where practicable, all combustibles shall be relocated at least 35 feet (10.7 m) from the work site. Where relocation is impracticable, combustibles shall be protected with flameproofed covers or otherwise shielded with metal or asbestos guards or curtains.
- Ducts. Ducts and conveyor systems that might carry sparks to distant combustibles shall be suitably protected or shut down.
- Combustible walls. Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.
- Noncombustible walls. If welding is to be done on a metal wall, partition, ceiling or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall be provided.
- Combustible cover. Welding shall not be attempted on a metal partition, wall, ceiling, or roof having a combustible covering nor on walls or partitions of combustible sandwich-type panel construction.

Pipes.

Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be undertaken if the work is close enough to cause ignition by heat conduction.

SPECIFIC RESPONSIBILITY

The Facility Manager shall be responsible for the safe handling of the cutting or welding equipment and the safe use of the cutting or welding process. The Facility Manager:

- Shall determine the combustible materials and hazardous areas present or likely to be present in the work location.
- Shall determine if a fire watch is necessary.
- Shall secure authorization for the cutting or welding operations from the Security Manager when a fire watch is necessary.
- Shall protect combustibles from ignition by the following:
- Have the work moved to a location free from dangerous combustibles.
- If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition.
- See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.
- Shall determine that the cutter or welder secures his approval that conditions are safe before going ahead.
- Shall determine that fire protection and extinguishing equipment are properly located at the site.

Where fire watches are required, the Facility Manager shall see that additional fire extinguishers are available at the site.

Welding or cutting containers.

NO welding, cutting, or other hot work shall be performed on used drums, barrels, tanks, or other containers.

Venting and purging. All hollow spaces, cavities or containers shall be vented to permit the escape of air or gases before preheating, cutting, or welding. Purging with inert gas is recommended.

Inspection Reports

Boom Lift Inspection Report

DATE: _____

EQUIPMENT ID #: _____

OPERATOR **NAME** & ID #: _____

HR METER READING: _____

SHIFT (Circle One): DAYS SWING GRAVES

PRE-SHIFT INSPECTION: At the start of the day, or at the beginning of each shift, the aerial platform should be given a visual inspection and functional test. Including but not limited to the following items.

PRE-INPECTION CHECK LIST	IN GOOD ORDER YES/NO	NEEDS ATTENTION/REMARKS
1- Operation and Emergency controls		
2- All Safety Devices		
3- Personal Protective devices (Including Fall Protection)		
4- Air, Hydraulic and Fuel Systems (Leaks)		
5- Cables and Wiring Harness		
6- Loose or Missing parts		
7- Tires and Wheels		
8- Placards, Warnings, control Markings, and operating manual (S)		
9- Outriggers, Stabilizers, Extendible Aisles, and Other Structures		
10- Guardrail System		
11- Items Specified by Manufacturer		

SUPERVISOR _____

Any problems or malfunctions that affect the safety of operations need to be repaired prior to the use of all equipment

Additional Remarks: _____

_____

_____

Confined Space Pre-entry Checklist

ISSUED (Date &Time): __EXPIRES (Date &Time): Job Site: Equipment Involved:
Work to be performed:

P R E-E N T R Y	E N T R Y
1. Atmospheric Check Time ___ ___ Oxygen _____% Explosive _____%LEL Toxic _____PPM	**1. Entry, standby and backup person** Successfully completed required training. Is it current?
2. Source Isolation (No Entry):	**2. EQUIPMENT:** Direct reading gas monitor-tested Safety harnesses and lifelines for entry and standby persons. Hoisting equipment Powered communications SCBA's for entry & standby persons. Protective equipment
Energy sources (incl/engulfment) blinded, blocked, disconnected or locked-out, etc.	Electrical GFCI Required
3. Ventilation Modification: Mechanic Natural ventilation only	

N/A Yes No

N/A Yes No

	N/A	Yes	No
4. Atmospheric Check (after isolation ventilation			
Oxygen %			
19.5 Explosive			
%LEL <			
Toxic PPM *			
Time			

** Entry and Work duration limits to be set prior to entry*

)

23.5

0 %

y.

3. RESCUE PROCEDURE:

In Emergency call Security Office

	N/A	Yes	No

If there is no reason to believe that conditions exist to require permit entry, then complete the PreEntry checklist and classify accordingly.

Permit *	
Non-Permit	

Entry

If **PERMIT** space or there is reason t believe that conditions may change adversely, then proceed to the Check portion of this permit.

We have reviewed the work authorized by this permit and the information contained herein. Written instructions regarding the specific hazards of the confined space entry have been reviewed with all employees.

Chief Engineer/Supervisor _____

(Name) (Signature)

Forklift Inspection Report

Forklift _____

At the start of the day, or at the beginning of each shift, the Forklift should be given a visual inspection and functional test. Including but not limited to the following items.

	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
DATE:														
ITEM INSPECTED:	OK	Repair	OK	Repair	OK	Repair	OK	Repair	OK	Repair	OK	Repair	OK	Repair
Forks, Backrest, Carriage														
Mast, Chain, Hydraulic, Lines														
Tires, Axles														
Overhead Guard / ROP														
Fuel Tank & Connections														
Fuel Level														
Engine Oil Level														
Radiator Water Level (Cold)														
Leaks Under Forklift														
Seat and Seat Belts														
Horn and/or Backup Alarms														
Lights														
Gauges and Instruments														
All Brakes														
Hydraulic Controls & Lift														
Steering														
Unit Hours:														
Inspector's Initials:														

Comments:

CAUTION – If the truck is in need of repair or in any way unsafe, the matter shall be reported to the designed authority and the truck shall not be operated until it has been restored to a safe operating condition!

If during operation the truck becomes unsafe in any way the matter shall be reported to the designated authority and the truck shall not be operated until it has been restored to safe operation!

Do not make repairs or adjustments unless specifically authorized to do so!

Ladder Inspection Checklist

Ladder No._____ Location_____

Ladder Type: _____

Ladder Substance: Wood_____ Aluminum_____ Steel_____ Fiberglass____

Ladder Style: Single_____ Extension _____ Step _____ Platform _____

Other_____

Inspection

Side Rails: Good_____ Bad_____ Need Testing_____

Comments: _____

Rungs or Steps: Good_____ Bad_____ Need Testing_____

Comments: _____

Rivets: Missing_____ Loose_____

Comments _____

Hardware:	**Good**	**Needs Repair**	**Date Repaired**
Slide Guides	_____	_____	_____
Rung Locks	_____	_____	_____
Safety Shoes	_____	_____	_____
Pail Shelf	_____	_____	_____
Spreader Braces	_____	_____	_____

Truss Rods and Blocks _____ _____ _____

Other _____

General Overall Condition: Good_____ Fair_____ Poor_____

Comments _____

_____

_____

_____ _____

Signature Date

Lockout Tagout Record Sheet

Danger / Caution Tag-Out Record Sheet	
Log Serial No.	Date / Time Tag-Out Issued
System or Component	
Reason for Tag-Out	
Personnel or Equipment Hazards Involved	
Amplifying Instructions	
Work Necessary to Clear Tag(s)	
Signature of person hanging tags	Signature of repair facility
Signature of person verifying tag-out	

	Notify "affected" employees and any employees working nearby

	Shut down the equipment
	Identify all energy sources and possible hazards. (Use the LOTO Initial Survey Form)
	Disconnect the power.
	Lock out or tag out the equipment.
	Neutralize other possible energy sources. - Lower all suspended parts - Block movable parts - Vent air pressure from pneumatic lines - Drain or bleed hydraulic lines to remove pressure - Release or block the spring energy - Secure machine products to ensure they cannot move, fall unexpectedly, etc. - Drain capacitors, and other sources of stored energy
	Test Equipment, if not energized, PERFORM SERVICE/MAINTENANCE. - Push start buttons. (TWICE) (Return to "off" or neutral position.) - Test electric circuits. (Only a "Qualified" person can do this.)

	After completion of work and BEFORE RESTARTING, double-check everything. - Equipment - In operating condition, lubricated, adjusted, etc. (CONTROLS ARE IN NEUTRAL) - Guards - in place - Tools – removed - Braces, pins, blocks, chains – removed - Pressure tubing, pipes, hoses - connected, with the valves closed - Work area – clear - Personnel - out of danger zones
	Affected personnel notified of startup.
	Tags and or locks - removed by the authorized employee or Repair Facility who installed them.
	Reenergize.

TAG Number	Location	Tagged Position/ Condition	Locked Yes / No	Posted by (Initial)	Clearance Position/ Condition	Clearance Authorized		Date/ Time Cleared	Cleared By (initials)
						Authorizing SPCC/STEC/EPEC	Authorizing Repair Activity		

Scissor/Vertical Lift Inspection Report

DATE: _____ EQUIPMENT ID #: _____

OPERATOR **NAME** & ID #: _____

HR METER READING: _____

SHIFT (Circle One): DAYS SWING GRAVES

PRE-SHIFT INSPECTION: At the start of the day, or at the beginning of each shift, the aerial platform should be given a visual inspection and functional test. Including but not limited to the following items.

PRE-INPECTION CHECK LIST	IN GOOD ORDER YES/NO	NEEDS ATTENTION/REMARKS
1- Operation and Emergency controls		
2- All Safety Devices		
3- Personal Protective devices (Including Fall Protection)		
4- Air, Hydraulic and Fuel Systems (Leaks)		
5- Cables and Wiring Harness		
6- Loose or Missing parts		
7- Tires and Wheels		
8- Placards, Warnings, control Markings, and operating manual (S)		
9- Outriggers, Stabilizers, Extendible Aisles, and Other Structures		
10- Guardrail System		
11- Items Specified by Manufacturer		

SUPERVISOR _____

Any problems or malfunctions that affect the safety of operations need to be repaired prior to the use of all equipment

Additional Remarks:

_____

_____

_____

Wheelchair Inspection Report

DATE: _____ EQUIPMENT ID #: _____

NAME of person using equipment: _____

ADDRESS: _____

PHONE NUMBER: _____

PRE-SHIFT INSPECTION: Before using equipment go through a checklist to ensure equipment is in good working order and has no malfunctions. Including but not limited to the following items.

INSPECTION CHECK LIST	IN GOOD ORDER YES/NO	NEEDS ATTENTION/ COMMENTS
Wheels are in good condition, not bent or warped.		
Wheels locks engage properly		
Seat and Back upholstery are not worn or torn		
No rust or loose connections		
Hand grips are firmly attached to the chair		
Loose or Missing parts		
Handrails are firmly attached to the wheels		
Check cross braces for loose nuts or missing parts		
Footrests-In place and in good condition		
ID # Label in place and visible		

I have received this wheelchair from the Salt Palace. I understand that I am responsible for any loss or damage occurring while I am in possession of this chair. I understand I will be responsible for the cost of replacement and or costs of repairs if needed. If equipment is not returned by designated time additional costs may apply. I have read and agree with the above statement.

SIGNATURE _____

BUSINESS CENTER EMPLOYEE SIGNATURE: _____

Any problems or malfunctions that affect the safety of operations need to be repaired prior to the use of all equipment

RETURN DATE: _____

SIGNATURE OF PERSON USING EQUIPMENT: _____

BUSINESS CENTER EMPLOYEE SIGNATURE: _____

Workplace Inspection Report

DATE: _____ EQUIPMENT ID #: _____

OPERATOR NAME & ID #: _____

HR METER READING: _____

SHIFT (Circle One): DAYS SWING GRAVES

PRE-SHIFT INSPECTION: Before the aerial platform is used and during use, THE OPERATOR should check the area in which the platform is to be used for possible hazards such as, but not limited to the following.

PRE-INPECTION CHECK LIST	IN GOOD ORDER YES/NO	NEEDS ATTENTION/REMARKS
1- Any drop offs or holes		
2- Bumps and Floor Obstructions		
3- Debris		
4- Overhead obstructions and high voltage conductors		
5- All hazardous locations		
6- Inadequate surface (S) All surfaces able to Support/Withstand all load forces imposed by the aerial platform in all operating configurations		
7- Tires and Wheels unobstructed		
8- Wind and weather conditions		
9- Presence of all persons		
10- All other possible unsafe conditions		

SUPERVISOR _____

Any problems or malfunctions that affect the safety of operations need to be repaired prior to the use of all equipment

Additional Remarks:

_____
_____
_____