

**APPENDIX D**

**HEALTH AND SAFETY PLAN**



# MWH Constructors

## HEALTH and SAFETY PLAN AND EMERGENCY RESPONSE PLAN

For

### USACE RAMS Easy Junior and Golden Butte Mine Restoration Project

Contract No. DACA45-03-D-001

Revision: 0

Revision Date:

Initial Issue Date: August 4, 2004

#### MWHC

Approved by:

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MWHC H&S Director

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Date

Prepared by:

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MWHC Project Manager

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Date

#### MWHA

Approved by:

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MWHA H&S Director

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Date

Approved by:

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MWHA Project Manager

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Date

## SUMMARY

Construction at the Golden Butte and Easy Junior Sites will include the following activities:

- Leach Pad Regrading, Soil Cover and Seeding;
- Leach Pad Lysimeter Installation;
- Process Ponds Conversion to Evaporation Basins;
- Process Pond Drainage Control Structure Installation;
- Process Ponds Solids Characterization;
- Infiltration Field Percolation Characteristics
- Infiltration Field Installation;
- Facilities Demolition and Disposal;
- On-site Landfill Construction and Closure;
- Cover Soil Confirmation Sampling
- Plant-Area Soils Characterization and Disposal; and,
- Waste Rock Pile Reclamation.

Hazards associated with these activities include:

- Exposure to potentially contaminated dust during regrading and other earthworks;
- Exposure to potentially contaminated waste in process ponds;
- Sharp and dangerous scrap and debris on the sites;
- Paints and greases; and,
- Fuels, mechanical fluids, cleaning solvents associated with heavy equipment operation.

In order to address these construction hazards, the Contractor has required all full-time construction personnel to complete 40-hour OSHA HAZWOPER training. There will be no need to partition the work area into hazard zones because there are no specific areas of contamination. There will be no decontamination procedures required at the end of shift work.

Personal protective equipment (PPE) requirements of all workers on site at all times is OSHA Level D (hard hat, safety shoes, safety glasses). Other PPE may include safety vests and hearing protection depending on the specific work task.

A Safety Manual is available for reference in the Site Trailer at all times. Emergency Response procedures are located in the manual. Emergency contact numbers are in the manual and posted on laminated sheets at various locations on the site in case of medical or fire emergency. The First aid kit and fire extinguishers are located in the Site Trailer.

Each subcontractor shall receive a copy of this document. They must ensure that the contents of the plan, relevant to their works, are communicated to their management, supervisors and personnel as is appropriate.

**Subsequent Record Issue & Revisions**

Issue	Date Issued	Description of Revision		Reviewed By	Authorized By
		Page No	Comment		

- Issue number to be inserted next to page number in footer.

This has been read by the following project based staff and they have a document available for reference:

Name	Position	Signature
	Project Manager	
	General Superintendent	
	Safety Supervisor	
	Subcontractor Supervisor	

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- A. Activity Hazard Analysis
- B. Monthly Subcontractor Safety Report
- C. Personal Safety and Health Acknowledgement Form
- D. Safety Meeting Record Form
- E. MWHC Procedures

## ACRONYMS

ASME	American Society of Mechanical Engineers
ANSI	American National Standards Institute
BLM	United States Bureau of Land Management
EJ	Easy Junior Mine
GB	Golden Butte Mine
GFCI	Ground Fault Circuit Interrupters
HSP	Health and Safety Plan
OSHA	Occupational Safety and Health Administration
PSI	Pounds Per Square Inch
PPE	Personal Protective Equipment

PM	Project Manager
RAMS	Restoration of Abandoned Mine Sites
ROPS	Rollover Protective Structures
UL	Underwriters Laboratories
USACE	United States Army Corps of Engineers – Omaha District
USEPA	United States Environmental Protection Agency
TBD	To Be Determined

## **1.0 INTRODUCTION**

### **1.1 PURPOSE OF THE PROJECT SAFETY PLAN**

This Project Health and Safety Plan (HSP) applies to construction activities that will be conducted for the USACE Restoration of Abandoned Mine Sites (RAMS) Easy Junior and Golden Butte project. It establishes general safety requirements, and procedures for the protection of personnel and to prevent and minimize personal injuries, illnesses and physical damage to equipment, supplies and property.

Each subcontractor shall receive a copy of this document. They must ensure that the contents of the plan, relevant to their works, are communicated to their management, supervisors and personnel as is appropriate.

All project personnel MWH Constructors, Inc. (MWHC) and MWH Americas, Inc. (MWA) personnel and its subcontractors and visitors shall comply with safety requirements of Occupational Safety and Health Act (OSHA), and the requirements of the project safety plan. In addition, project personnel are responsible to comply with health and safety procedures required by their organizations. Where such safety and health requirements are more stringent than the procedures specified herein, they shall be followed and shall supersede the requirements of this plan.

The evaluation of hazards, levels of protection, and procedures specified in this plan are based on the best information available and represent the minimum health and safety requirements to be observed by all personnel while engaged in this project. It is recognized that site conditions may change during construction; therefore, it is imperative that safety measures be thoroughly assessed prior to and during the planned activities.

### **1.2 PROJECT SAFETY GOAL**

The goal of this project is zero preventable incidents (OSHA recordables, lost workdays, property damage etc.). To achieve this goal, everyone on the project is responsible for eliminating or correcting at risk-behavior or unsafe conditions. If you see unsafe conditions correct it or immediately notify your supervisor. If you observe someone performing an unsafe act let them know that their behavior is putting them in danger.

### **1.3 SUBCONTRACTORS SAFETY PLAN**

Before work is conducted, each subcontractor shall provide a written activity hazard analysis (AHA) of their work and associated tasks. The AHA shall list the sequence of work, the hazards involved, and the safety controls that will be used to conduct work. A blank AHA form is provided in Attachment A of this HSP. In addition, each subcontractor is responsible for preparing a project specific safety plan as applicable to his/her scope of work. The plan shall be acceptable to MWHC and MWA prior to the start of work. The



plan shall provide for the means and methods to implement and enforce the precautions and requirements for the safety of persons and property. The plan shall include the following:

- Activity Hazard Analysis (AHAs)
- Identification of person(s) with authority and responsibility for implementing the safety plan.
- A system for ensuring that personnel comply with safe and healthy work practices.
- Procedures for dissemination of safety information including the compilation and distribution to appropriate parties of records of notice, training, meetings, inspections, violations, corrective actions and other activities that reflect on the safety of the project.
- Methods used to identify and evaluate hazards and the means and methods that will be used to eliminate or control hazards.
- Procedures for reporting and investigating occupational injury or illnesses.
- Methods for reporting and correcting unsafe or unhealthy conditions.
- Procedures for conducting safety inspections that document unsafe condition and work practices.
- Hazard Communication Program
- Emergency Action Plan.
- Substance Abuse Policy

#### **1.4 MULTIPLE EMPLOYER PROJECTS**

Under OSHA, each employer is required to provide a safe and healthful working environment for employees. When several employers are working simultaneously on the project, the activities of one employer could expose personnel of another company to a hazard.

Where an employer creates unsafe conditions, the exposing employer shall be responsible for exercising reasonable diligence to discover the condition, and for taking steps to protect their personnel. When the exposing employer has authority to correct the hazard, it shall do so. Where the exposing employer lacks the authority to correct the hazard, the employer shall ask the creating and/or controlling employer to correct the hazard; inform its personnel of the hazard; and take reasonable alternative protective measures. In extreme circumstances (e.g., imminent danger situations), the exposing employer shall remove their personnel from the area to avoid the hazard.

#### **1.5 UNSAFE CONDITIONS**

The subcontractor shall immediately correct any conditions that are brought to its attention. Failure to correct unsafe conditions will result in the stoppage of the immediate work until conditions are corrected to the satisfaction of MWHC and MWHA.

## **1.6 DISMISSAL**

Personnel refusing or repeatedly failing to comply with MWHC and MWHA job safety requirements, or supervisors failing to enforce compliance with these and referenced standards shall be promptly disciplined by their employer, which at MWHC's and MWHA's discretion, may include removal from the project.

## **1.7 SUBSTANCE ABUSE, AND WEAPONS**

The project will not tolerate unsafe workplace conditions created by persons with substance-abuse (alcohol and drug) problems. All personnel on site are expected to be in suitable mental and physical condition while at work, performing their jobs satisfactorily, and behaving appropriately. Each employer on the project site shall have a written substance abuse program that is acceptable to MWHC and MWHA.

No firearms of any kind are permitted on the project. Only knives germane to work and suitable for construction will be permitted. Switchblades, stilettos, flip knives, throwing stars, and other martial arts weapons are expressly prohibited.

## **1.8 SITE VISITORS**

The MWHC Project Manager with concurrence from the USACE representative may give approval to visitors to enter the project. No visitors will be permitted into the project unescorted. Visitors are required to attend a project safety orientation upon their first visit. Visitors are also required to provide their own personal protective equipment necessary to provide an adequate level of protection for the purpose of their visit.

## **1.9 REPORTING UNSAFE CONDITIONS**

When personnel observe an unsafe condition that is likely to cause harm, they shall immediately report the hazard to their supervisor so that prompt corrective action can be taken to correct the hazard. In cases of imminent danger, project personnel at all levels shall stop an activity if s/he is aware that by not doing so would cause serious harm to themselves or others.

## **1.10 SAFETY SUGGESTIONS**

The Project has an "open door policy" for project personnel to make suggestions to improve safety. Suggestions are welcome and may be made by any person conducting or observing work, or affected by work on the project. Suggestions may be communicated verbally to an MWHC management or in written form.

## **2.0 PROJECT DESCRIPTION**

### **2.1 SITE LOCATION, DESCRIPTION AND DURATION**

#### **2.1.1 Location and Description**

MWH Americas, Inc. (MWH) has been contracted by the USACE to perform design/build engineering and construction services for reclamation of the Easy Junior and Golden Butte mine sites. MWHC will be the General Contractor for the activities described herein. The Golden Butte and Easy Junior abandoned mine sites, located in White Pine County near Ely, Nevada, have been selected for reclamation as part of the Nevada RAMS program. Closure activities will be directed by the BLM – Ely District.

The Golden Butte Mine Site is an abandoned mine located in White Pine County, Nevada, approximately 45 miles northwest of Ely, Nevada. The following mine components exist at the Golden Butte mine: two heap-leach pads (run-of-mine and crushed ore pads); three process ponds (run-of-mine pregnant, crushed ore pregnant, barren ponds); a waste rock pile; an open pit; two water wells; a fresh water pond; and ancillary facilities and debris. The Easy Junior Mine Site is an abandoned mine located in White Pine County, Nevada, approximately 50 miles southwest of Ely, Nevada. The following mine components exist at the Easy Junior mine: one heap-leach pad; three process ponds; a waste rock pile; an open pit; a fresh water pond; and ancillary facilities and debris.

#### **2.1.2 Project Duration**

Mobilization for 2004 construction is scheduled for the middle of August 2004. Project construction (for the 2004 season) is expected to be complete by November 2004. Additional project construction activities are anticipated to commence in the spring of 2005.

### **2.2 WORK HOURS AND WORK DAYS**

The work conducted on the Project will be day shift work. Normal work hours will be from 7:00 a.m. to 6:00 p.m., Monday through Thursday.

### **2.3 PROJECT DESCRIPTION**

The reclamation services to be conducted at each site involve the regrading and placement of soil cover on crushed rock heap leach pads, constructing evaporation basins in existing lined process ponds, demolishing and concentrating existing buildings and facility structures into a permitted Class III landfill (within existing process pond containment), and installation of leach field. At each of these sites, the existing heap leach pads will be closed by regrading to a configuration that is more stable and will support soil cover for revegetation. Following regrading, each heap leach pad will be covered with approximately

12 to 18-inches of soil excavated from local borrow sources. Existing process ponds will be drained and backfilled with select soil and rock to create either evaporation basins for heap leach pad draindown waters, or closed in place.

## **2.4 UNIQUE SITE CONDITIONS, ACTIVITIES, AND ISSUES**

### **2.4.1 Site Accessibility**

The project sites are remote facilities, located approximately one hour north (Golden Butte mine) and one hour south (Easy Junior mine) of Ely, Nevada. Access to each site is by dirt roads off of the main highways. Weather conditions can drastically impact accessibility to each site. Field personnel on site during project work should be prepared by carrying/maintaining the necessary provisions (for eating, drinking, personal hygiene and shelter) either in their vehicles or at the project site.

### **2.4.2 Heavy Equipment**

Heavy earthmoving equipment will be transported to and operated on the project sites by subcontractor personnel. The subcontractor and MWHC safety representative shall ensure that safe vehicle operations are adequately known in advance and strictly adhered to. The subcontractor and MWHC safety representative shall ensure that heavy equipment are adequately inspected and maintained for safe operation throughout the duration of the project. The subcontractor and MWHC safety representative shall ensure that routes of travel (access roads, haul roads, etc.) are sufficient in strength and load capacities to withstand the heavy equipment and associated movement of soil and rock within the boundaries of the site.

### **2.4.3 Snakes**

Site personnel shall beware of snakes that inhabit the area. To avoid an encounter with a snake, personnel should avoid dark locations and brush or debris piles. Use a long handle tool to disturb suspect locations before reaching in. Clearing and grubbing should result in snakes relocating to other non-disturbed areas. If you do encounter a snake, back away and provide the snake with room to relocate. Do not try to handle live or dead snakes. If bitten by a snake, keep the affected area below the level of the heart, remove any restrictive clothing, jewelry, etc., and invoke emergency contact /response activities immediately.

### **3.0 ORGANIZATION AND RESPONSILITIES**

#### **3.1 MWHC**

The President of MWHC, Mark Swatek, is the official within the company who is responsible and accountable for the overall safety program and safety performance. In turn, he holds MWHC project management responsible for and accountable for implementing MWHC safety program, project safety plan and for safety performance of operations under their direction. The operations management structure is as follow:

- President – Mark Swatek
- Director of Safety - Michael Grasso, CIH
- VP Federal Operation- Joe Willich
- Project Manager – Jeff LeBlanc
- General Superintendent/Safety Supervisor – Steve Arington, Kieth

##### **3.1.1 Responsibilities of MWHC**

The Project Manager (PM) is responsible for and accountable to senior management for the implementation and enforcement of the project health and safety plan and the company safety program. In turn all MWHC personnel on the project are responsible for and accountable to the PM for the same.

The General Superintendent/Safety Supervisor has the primary staff responsibility to assist the PM for the implementation and enforcement of the project safety plan and the company safety program. The General Superintendent is further responsible for inspecting the project in order to identify at-risk-behavior and unsafe conditions, which may exist on the project. The PM and/or subcontractors supervisory personnel shall be informed of any at-risk-behavior or unsafe working conditions, and are required to initiate and complete effective corrective action.

MWHC staff as part of their oversight duties shall be responsible to observing personnel for at-risk-behavior and work areas for unsafe conditions. Project staff have the authority to stop work, which poses an immediate danger. At-risk-behavior of individuals or unsafe conditions shall be promptly reported to the subcontractor's supervisory personnel who is in charge of the activity or personnel. The at-risk-behavior or unsafe condition and action taken by the responsible party shall be document and reported to the General Superintendent.

#### **3.2 MWHA**

MWHA holds the contract with the USACE for the work to be performed for the RAMS program. MWHA is responsible for overall communication to the USACE, performance of the engineering support for the project, and performance of the construction reporting associated with this project. The MWHA operations management structure is as follows:

- President – Don Smith
- Director of Safety – Larry Perkins
- Chief Operating Officer – Gary Erickson
- Business Unit Leader – Allan Krause
- Project Manager – Jay Pennington
- Project Engineer – James Thompson

### 3.3 SUBCONTRACTORS

Subcontractors are responsible for working in accordance with the project safety plan and established safety procedures/practices. Each subcontractor shall designate a “qualified person” or persons to oversee construction activities and to implement and enforce the project safety plan and company safety procedures. The “qualified person” shall be capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to personnel, and who has authorization to take prompt corrective measures to eliminate them

The subcontractors for this project are as follows:

<b>Subcontractor</b>	<b>Trade</b>	<b>Contact</b>
High Mark Construction	General Contractor	Richard Katsma

### 3.4 INCIDENT INVESTIGATION

Incidents that result in injury and/or loss of equipment or damage to property shall be reported immediately to MWHC site manager after providing or obtaining appropriate medical and emergency assistance. Subcontractors shall conduct a thorough investigation of any incident to determine the contributing factors. The subcontractor shall submit a comprehensive written report of findings and corrective action taken to prevent a similar incident from reoccurring to MWHC within one (1) working day. The MWHC site manager will notify the MWH Project Manager and Regional Health and Safety Manager as soon as possible within hours for initial verbal reporting and within one day for the written reports.

Incidents that shall be immediately reported include but are not limited to near-miss, fires, utility strikes, vandalism, equipment failure, and spills and leaks. All subcontractors are responsible for investigation the incident as soon as possible.

MWHC site manager shall notify the USACE as follows:

#### **Immediate Notification of the USACE representative**

- Lost time events ( life threatening/ non life threatening)
- Fatalities or permanent total disabling injuries to or involving on duty military, government civilian, or contractor personnel;

- Incident in which 3 or more persons are hospitalized and
- Damage of \$100,000 or more to the USACE's or contractor's property and or equipment.

**Next Workday Notification of USACE representative**

- Near Miss Accident-minor
- Near Miss Accident-serious
- Property Damage Over \$2,000

All incidents noted with the exception of near miss accidents require the preparation of ENG 3394. This document shall be initiated within 3 working days of the occurrence and submitted within 10 calendar days.

**3.5 SAFETY INSPECTIONS**

Subcontractors shall conduct a written safety inspection of their work areas once a week. A copy of inspections will be given to MWHC and MWA. The MWHC Safety Supervisor will conduct daily safety observation and a written safety inspection of the overall project every 10 days.

**3.6 SAFETY PERFORMANCE REPORT**

Each and every month in which a subcontractor performs any work on the Project, a monthly summary of hours worked, number and types incidents (e.g., first aid, near misses, OSHA recordables) shall be provided to the MWHC safety supervisor no later than the second workday of the new month. A copy of the Monthly Subcontractor Safety Report is provided in Attachment B of this HSP.

## **4.0 TRAINING REQUIREMENTS**

### **4.1 INTRODUCTION**

Each employer shall ensure that personnel under their control have received the necessary safety training as mandated by OSHA, DOT, and USACE requirements. Documentation and certificates of training listed in Section 5 shall be provided to MWHC Safety Supervisor.

### **4.2 PROJECT INDOCTRINATION**

Prior to the first work shift or visit personnel shall receive project specific safety indoctrination given by MWHC Safety Supervisor. Personnel shall be provided with a guide book (Basic Safety Rules For Construction) containing pertinent provisions of the Project Safety Program.

Orientation shall include but not limited to:

- General safety rules for personal conduct.
- Site contaminants and their hazards
- Substance abuse policy (Zero Tolerance).
- Security and accessibility procedures
- Emergency notification.
- Personal protective equipment and construction dress wear.
- Rule to attend weekly toolbox safety talks.
- Incident reporting.
- Basic project rules for construction activities.

Each person participating in the orientation shall acknowledge receipt of these instructions by filling out the Personal Safety and Health Acknowledgment form located in Attachment C. A copy of this acknowledgement shall be retained on the project to document that the person has been orientated.

### **4.3 TOOLBOX SAFETY MEETINGS**

All site personnel shall attend a weekly toolbox safety meeting held on Monday mornings and sign the meeting roster. Each subcontractor shall conduct the meetings for their personnel. Meetings will cover past activities, plan for new or changed operations, review pertinent aspects of appropriate activity hazard analyses (by trade), establish safe working procedures for anticipated hazards, and provide pertinent safety and health training and motivation. As part of the toolbox safety meeting, employee feedback (comments, questions, health or safety concerns) are welcomed. Meetings shall be documented, including the date, attendance, subjects discussed, and names of individual(s) who conducted the meeting. Meetings will be documented on Safety Meeting Record Form (or equivalent) located in Attachment D.



#### **4.4 SUPERVISORS SAFETY MEETING**

At least once a month safety meeting for all supervisors on the project location shall be held. The meetings and will cover past activities, review of incidents, plan for new or changed operations, review pertinent aspects of appropriate activity hazard analyses (by trade), and establish safe working procedures for anticipated hazards. The supervisors safety meeting shall be documented, including the date, attendance, subjects discussed, and names of individual(s) who conducted the meeting.

## **5.0 GENERAL SAFETY REQUIREMENTS**

### **5.1 ACTIVITY HAZARD ANALYSIS (AHAs)**

In accordance with MWHC procedures, activity hazard analyses shall be prepared for the general project activities. The AHA format and preparation guidelines can be found in Attachment A. MWHC and the subcontractor will work together to prepare project specific AHAs prior to the onset of field work, and include these AHAs with the project specific Health and Safety Plan. General MWHC procedures deemed applicable for the project work are included in Attachment E. In addition, other general safety requirements established for this project are summarized in the following sections.

### **5.2 EXCAVATIONS**

Excavating and trenching operations shall be performed in such a manner as to protect personnel from the dangers associated with trenching and excavating such as cave-ins, and to prevent damage to underground utilities, should they exist. All excavating subcontractors are responsible for compliance with these criteria.

Each subcontractor shall have a qualified person on site to evaluate each trench or excavation and determine the necessary precautions to take.

#### General Requirements

- Sufficient room (minimum ten feet call utility company to determine safe line clearance) shall be maintained from overhead power and communication lines.
- If underground utilities not previously identified are encountered, the subcontractor will cease work immediately and consult with the MWHC Project Manager or designated representative before proceeding with the work.
- Protective system(s) to prevent cave-in shall be used when personnel enter excavations five feet or greater in depth (except in Solid Rock), or if the qualified person determines it is necessary at shallower depths.
- Where alternative protective systems are used such as trench boxes, hydraulic shoring, etc. is used it shall be used in accordance with the manufacture's specifications and limitations. The manufacture's tabulated data for such systems will be maintained on the project site.
- Before personnel enter excavations and during work, the qualified person shall inspect the excavations, the adjacent hazards, and protective systems for evidence of possible cave-in/failure of protective systems, hazardous atmosphere, and other hazardous conditions.

- The spoils pile shall be placed at one side of the excavation. At a minimum, the toe of the spoil pile shall be at least three feet away from the edge of the excavation. The spoils pile shall be moved farther back in proportion to the depth of the excavation. The spoils pile height shall not exceed the depth of the excavation and shall be sloped to prevent the soil and rocks from sliding into the excavation.
- When personnel are required to enter a trench or excavation over four feet deep, an adequate means of exit, such as a ladder, steps, or ramp will be provided and located so as to require no more than ten feet of lateral travel. Ladders will extend at least 36 inches above the edge of the trench.

#### Training Requirements

Employers shall have the responsibility of ensuring that their personnel are trained in the hazards associated with trenching and excavations and the necessary safety precautions to be taken. The training shall meet the requirement that the training can be verified by documentary evidence.

### **5.3 FIRST-AID STATION**

Each employer shall make available to his/he personnel, first aid services, and shall make provisions for medical care as necessary. The employer shall maintain a first aid kit in accordance with these requirements. In addition, where the eyes or body of any person may be exposed to injurious corrosive materials, dust etc., suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate use.

#### General Requirements:

- The contents of first aid kits are to be checked by the employer before being sent out to the Project and at least weekly to ensure that the expended items are replaced.
- Emergency telephone numbers, i.e., physician, hospital, and ambulance shall be posted and employers shall have a means to summon for help (cell phone, radio, other).
- Each field vehicle on site, including privately owned vehicles and rented vehicles, that could be used to transport injured personnel to medical facilities will have a copy of the map to the nearest hospital inside the vehicle.

#### Training Requirements:

Employers shall have the responsibility of ensuring that at least one employee is first aid and CPR trained and that training can be verified by documentary evidence.

### **5.4 HAND AND POWER TOOLS**

Hands and power tools used on the project shall be used in accordance with their intended design per the manufacturer's recommendations. Tools shall be maintained in a safe condition and inspected for broken or defective parts.

- All guards originally supplied with power tools shall be in place when the tool is in use. Guards shall not be altered, modified, or defeated. If hand-held power tools are equipped with a constant pressure switch (a dead man switch), the switch shall not be defeated (taped or wired) in order to keep the power on.
- All powder-actuated tools (PATs) shall be operated following manufacturer's instructions and American National Standards Institute (ANSI) Standard A10.3, Powder-Actuated Fastening Systems—Safety Requirements. An operator's instruction manual shall be kept in the carrying case of the tool at all times.
- Tools shall be maintained in a safe condition. Tools will be inspected for broken or defective parts such as split/cracked handles, mushroomed heads on drift-pins, damaged electrical cords, etc., and removed from use until repaired or replaced. Defective power tools shall be tagged "OUT OF SERVICE" until repairs can be made.
- Hoses supplying pneumatic power tools will be provided with clips or retainers to prevent disconnect. Hoses greater than ½-inch inside diameter shall have a shut-off valve at the source.
- When compressed air is used for cleaning, the pressure will be reduced to less than 30 psi.
- Fuel-powered tools shall be stopped when refueled, serviced or maintained. Tools shall be allowed to cool down as necessary before refueling.

Training Requirements:

Only properly trained and qualified operators are permitted to use PATs. Operators shall possess an operator's card issued by the manufacturer's authorized dealer or distributor.

## **5.5 HAZARD COMMUNICATION**

Employers shall have available on the project their company's written Hazard Communications program. Material Safety Data Sheets (MSDS) for products that are used on the project shall be readily available to all personnel. Subcontractors are required to provide the MWHC Safety Supervisor a copy of their written Hazardous Communication Program and MSDSs. This requirement does not relinquish the subcontractors from maintaining their own copies of Material Safety Data Sheets.

Under the hazard communication requirements each employee has the responsibility to:

- Inform personnel about hazardous chemicals in their work area upon initial assignment and whenever a new hazard is introduced.

- Verify that all containers are labeled as to their content and hazard and that labels are legible and not removed.
- Inform personnel of hazards when performing non-routine tasks.
- Inform other employers of the hazardous chemicals their personnel may be exposed to while working and any precautionary measures that shall be taken to protect these persons during normal operating conditions or foreseeable emergencies.

Training Requirements:

Employers shall have the responsibility of ensuring that their personnel are trained on hazardous chemicals in their work area. Training shall be repeated whenever a new physical or health hazard is brought into their work area. The training shall meet the requirement EM 385-1-1 Section 6 and that the training can be verified by documentary evidence.

## **5.6 HOUSEKEEPING AND STORAGE OF MATERIALS**

Each employer shall keep work, storage, and walking surfaces free from personal (e.g. food scraps, cups and can), packaging and construction process trash. The qualified person is responsible for ensuring that storage of material will not create a safety or health hazard and that good housekeeping measures are followed.

General Requirements

- Storage areas and walkways shall be maintained reasonably free of dangerous depressions, obstructions, and debris. Piled or stacked materials shall be placed in stable stacks to prevent them from falling, slipping, or collapsing.
- Rubbish, scraps, and debris shall be removed from the work area as soon as possible.
- Aisle ways, walkways and access points shall be kept clear of trash, material, tools, equipment, and electrical cords to prevent exposure to trip, slip and fall hazards.

Training Requirements:

Employers shall have the responsibility of ensuring that their personnel are trained in good housekeeping techniques and in the proper storage of materials.

## **57 INCLEMENT WEATHER**

Weather conditions on the project will vary to include wind, rain, snow and thermal extremes.

Heat related illnesses are a potential concern even in summer and fall. Frequent rest periods and consumption of fluids such as water and sports drinks are required to reduce or

prevent heat stress. The use of personal protective equipment can significantly increase heat stress; heat stress can also occur in people wearing regular, work clothing.

The use of Wet Bulb Globe Temperature (WBGT) shall be used to determine the environmental contribution to heat stresses. The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) booklet (current edition) shall be adhered to when using the WBGT.

### Work Rest Cycle Based on the WBGT( °F)

Work Demands	Acclimatized				Unacclimatized			
	Light	Mod	Heavy	Very Heavy	Light	Mod	Heavy	Very Heavy
100 % Work	84	81	78	-	81	77	72	-
75 % Work 25 % Rest	87	83	81	-	84	79	76	-
50 % Work 50 % Rest	89	85	83	81	86	82	78	77
25 % Work 75 % Rest	90	87	85	84	87	84	82	80

#### Training Requirements:

Personnel shall be trained in the recognition of heat- related disorders and the prevention of heat-related disorders and the controls in place to minimize the danger of heat related illness. The training shall meet the requirement that the training can be verified by documentary evidence

## 5.8 MATERIAL HANDLING

Subcontractors are responsible for the safe handling of materials.

#### Rigging Equipment

- Each day, before being used, the slings and all fastenings and attachments of rigging equipment shall be inspected for damage or defects by a qualified person. In addition, the rigging equipment shall be inspected during use to ensure it is safe. Defective equipment shall be removed from service.
- Safety latches on hooks shall not be deactivated or made inoperable.
- When chains are used for lifting they shall be welded alloy steel chains. Welded alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer.

Chainfalls or chain hoist shall be inspected before use. Inspection includes the attachment point and hook. The attachment point shall support the weight of the load.

## 5.9 MOTOR VEHICLES AND MECHANIZED EQUIPMENT

All construction equipment, with the exception of light service trucks, panel, pickup, station wagons, and crawler type cranes will be equipped with reverse signal alarms. Rollover protective structures will be required on backhoes, skid steers, and water trucks with the tank lower than the cab, or other equipment where OSHA requires their use. Personnel shall wear seat belts when operating heavy equipment. Self-propelled earthmoving and construction equipment shall be inspected before each day or at the beginning of each shift. The inspection shall be done in accordance with the manufacturers' and owners operating requirements.

### General Requirements

- Personnel shall not be transported in the back of a pick-up truck or similar vehicles of conveyances.
- Seat belts shall be used at all times when vehicles and equipment is equipped with seat belts.
- Only trained and qualified personnel shall be permitted to operate heavy equipment.
- All heavy equipment shall be equipped with at least one dry chemical fire extinguisher.
- Work areas shall be arranged as to minimize the backing of heavy equipment and trucks. Heavy equipment and trucks will have operational reverse signal alarms.
- Safe distances shall be maintained between heavy equipment and overhead power lines and utility poles. The minimum safe clearance distance is 10 feet. The utility company shall be notified and consulted to determine the actual safe clearance distance.
- Equipment operators will be responsible for the safe operation of the equipment and for the safety of those working around the equipment. When mounting or dismounting equipment maintain three points of contact (two-hands/one foot or two-feet/one hand).
- Personnel stereo headsets and the use of cellular telephone shall not allowed when operating equipment or working near operating equipment.
- Tools, personal clothing, water jugs, or lunch boxes shall not be stored on or in heavy operating equipment. The operator's personal artifacts are permitted only and shall be secured in the cab of the equipment.

- Personnel shall wear hard hats and brightly color traffic safety vest for visibility and shall stay out of the operating envelope/swing radius of heavy operating equipment. Personnel shall not walk under or work over suspended loads and shall maintain eye or verbal contact with the equipment operators.

Training Requirements:

Employers shall have the responsibility of ensuring that personnel are qualified by training or experience to operate heavy equipment. In addition, personnel shall be trained to recognize the hazards associated with working near heavy equipment. The training shall meet the requirement that the training can be verified by documentary evidence.

## **5.10 MUSCULOSKELETAL DISORDERS**

Musculoskeletal disorders typically result from repeated use of hand tools and the vibration of power tools, resulting in aches, pain or disease to the wrists and forearms, and from prolonged static postures, resulting in back and leg pain. To avoid these hazards and their end results, workers should observe the following:

- Work in a neutral body position with the neck straight, arms hanging from the shoulders, back positioned with the natural curve in the lower back supported and all other joints at right angles.
- Warm up muscles before work by doing warm up exercises.
- Try to work with muscles relaxed.
- Avoid slumped sitting positions, rounded shoulders, sway back, or overly straight or stiff posture.
- Take mini breaks to stretch the neck and body by circling, shrugging, and arching. This will increase circulation and relieve tension.
- Change position as often as necessary.

Back injuries are common in the workplace due to improper lifting. To avoid these injuries, the following should be observed:

- Size up the load and get help to lift if necessary or use a machine.
- Place heavy items on a surface that is waist high to avoid bending down or reaching.
- Push rather than pull the object.
- Keep the load close to the body.



- Bend at the knees and hips to avoid pressure on the lower back.
- Do not twist when lifting and watch out for hole or depressions when walking.
- Lift with the muscles in the legs instead of the back.

## 5.11 NOISE

Some of the work that will be performed on the project may involve tools and equipment that produce noise at levels that could cause workers to experience work induced hearing loss. When noise levels exceed 85 decibels, administrative, engineering controls and/or hearing protection shall be used.

As a rule of thumb, if a person must shout to be heard by another person from a distance of three feet away, noise levels are too high, and hearing protection should be used. Supervisors are responsible to instruct personnel about good hygiene when using earplugs, and are to provide an adequate supply of earplugs for frequent change-outs.

## 5.12 PERSONAL PROTECTIVE EQUIPMENT

The dress for this project requires that all personnel shall wear shirts with sleeves and long trousers that are ankle length. Shorts, tank tops, sneakers and other inappropriate work attire are not permitted on this project.

On this project all personnel shall wear approved hard hats and steel-toe protective footwear at all times.

It is the responsibility of each employer to evaluate each task and determine the appropriate personal protective equipment required for the task, this information shall be communicated to affected personnel.

### General Requirements

- Hard hats shall be worn with the brim point forward.
- Hearing protection shall be provided by the employer and worn by personnel when a person has to shout to be heard when 3 feet or less a way from the person they are communicating with.
- Material Safety Data Sheets (MSDS) shall be referenced to identify the proper chemical resistant protective garments and gloves.

### Training Requirements:

Employers shall have the responsibility of ensuring that their personnel are trained in the proper use, care and limitation of personal protective equipment. The training shall meet the requirement that the training can be verified by documentary evidence.

### 5.13 SANITATION

Employers shall provide an adequate supply of potable drinking water for their personnel. Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a drain faucet. Water shall not be dipped from containers. Containers are to be clearly marked as to the nature of their contents and not used for any other purpose. A common drinking cup is prohibited. Where disposable cups are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups will be provided.

Each subcontractor shall provide toilet facilities for their personnel. Each subcontractor providing toilet facilities shall make arrangements too have the facilities pumped and cleaned weekly or more frequently based on usage.

#### General Requirements

- Personnel shall be provided with a clean and safe area to take breaks.
- All outlets carrying non-potable water shall be marked.
- Covered containers will be provided for food scraps and lunch remains.

## **6.0 MWHC'S EMERGENCY RESPONSE PLAN**

### **6.1 PURPOSE OF THE EMERGENCY RESPONSE PLAN**

The purpose of this Emergency Response Plan is to outline the necessary procedures to be implemented at either the Golden Butte or Easy Junior abandoned mine sites in response to unexpected situations that may develop as the result of project activities. The Emergency Response Plan is designed to control an unexpected situation so that the outcome will have a limited impact on personnel, the project, and the community.

This document should be used by MWHC as a reference in identifying, controlling and responding to potential emergency scenarios that could occur as result of project activities.

### **6.2 PRE-PLANNING**

In order to handle emergencies effectively, planning is essential. Decisive action is imperative when an emergency arises. Procedures shall be in place to immediately respond to an emergency situation. Site personnel shall be knowledgeable of their roles and responsibilities. Supplies and equipment shall be on hand and in good working order to address the emergency. Delays can create life-threatening situations.

Prior to the start of the Project, the MWHC Safety Supervisor will meet or discuss with the outside response agencies (USACE, fire, police, EMS and medical) to coordinate response efforts. During the initial discussions, response personnel will be briefed on the scope of work at the site; various response situations, site access control measures, and types of incidents for which response may be required. Each response agency will be kept informed as site activities and conditions change during construction activities.

Emergency communication with the USACE will be through pre-determined personnel or channels specified by the USACE.

### **6.3 RESPONSIBILITIES**

Typically, the MWHC's Project Manager is the primary Emergency Response Coordinator. However, due to the remote facility location, the alternate Emergency Response Coordinator is the Safety Supervisor. Personnel roles and lines of authority are listed in the order in which they will assume responsibility.

#### **6.3.1 Emergency Response Coordinator**

The Emergency Response Coordinator is responsible the implementation of the Emergency Response Plan. Specific responsibilities:

- Serves as liaison with appropriate government officials and the client representative.

- Interacts with any agency representatives who respond to the site as well as coordinate communications with the media through MWHC or clients Information and Public Affairs.

### **6.3.2 Safety Supervisor**

The Safety Supervisor is responsible for the implementation of the Emergency Response Plan and for providing emergency response training to personnel. The Safety Supervisor has the following responsibilities:

- Pre-emergency coordination with the local USACE, fire departments, police and hospitals.
- Updating and verify emergency telephone numbers.
- Monitor weather for storm warnings.
- Verifies that all personnel/ visitors are accounted for.
- Ensure that emergency evacuation routes are clear and that all personnel are aware of the routes.

## **6.4 COMMUNICATIONS SYSTEM**

Cellular telephone will be available at the project site. However, connectivity for cellular phones may not be consistent depending upon the carrier service and weather. A list of emergency telephone numbers will be posted on site and will be made available to personnel with cellular telephones.

## **6.5 ALARM SYSTEM**

Since the majority of the project will involve small work groups where individuals are working in close proximity to each other, a verbal warning signal will be used for alerting personnel of hazardous conditions or an evacuation.

## **6.6 EVACUATION ASSEMBLY AREAS**

A designated evacuation assembly area shall be established. The location of the assembly area will be communicated to on site personnel. In the event of an emergency, personnel shall evacuate to the designated assembly area.

Evacuation routes will be clearly communicated to personnel. This information will be discussed during the Toolbox Safety Meetings.

## **6.7 PROCEDURES TO ACCOUNT FOR PERSONNEL**

Personnel shall immediately report to the designated assembly area and remain there. A roll call shall be performed to account for all personnel and to verify that total evacuation has taken place.

## **6.8 EMERGENCY EQUIPMENT AND SUPPLIES**

The appropriate emergency equipment will be kept on the project site and maintained in good working order at all times. Equipment used for emergency response will be segregated from equipment and supplies used routinely. The segregation of the response equipment will verify that such equipment is available when required. Some regular construction equipment can double for emergency use, such as gas detection equipment, first-aid kits, fire extinguishers, and shovels.

## **6.9 SITE SECURITY AND CONTROL**

In an emergency, site security and control of the site remain the responsibility of MWHC and until they are relieved of these duties by the arrival of the response agency's incident commander or a police official.

In a situation where the immediate area needs to be secured, the affected area will be cordoned off. As necessary, traffic shall be rerouted, personnel posted to warn others, and a sign-in/sign-out log shall be established.

The procedures for securing the incident scene are as follows:

- Secure the area to prevent unauthorized personnel from entering the area
- Record who has entered the area and for what purpose.
- Do not touch or move any equipment or objects.
- As soon as possible photograph the scene from various angles.

## **6.10 CRITICAL OPERATION PROCEDURES**

There are no critical operations that require a person to remain at their work area during an emergency. Personnel shall immediately evacuate the area and report to the assembly area. Once evacuated from the area, personnel shall not re-enter the area. Re-entry shall be made only when conditions have been determined to be safe.

## **6.11 EXTERNAL COMMUNICATIONS**

Under no circumstances may site personnel discuss an incident with the media, even if people from the media ask for or demand information. Personnel should not feel obligated, nor is it in MWHC's interest, to speculate on the cause of the incidents, the severity of injuries, or the cost of repairs. Personnel are cautioned that any information given to the media could be constructed as an "official" response from MWHC.

If approached by the media, contractors are advised to refer all media inquiries to the MWHC Project Manager. The MWHC Project Manager shall coordinate all media inquiries through corporate channels

## **6.12 REVIEW OF RESPONSE AND FOLLOW UP**

As an integral part of the Emergency Response Plan, the Project Manager and Safety Supervisor will review the emergency response activities. When reviewing information, the following will be presented:

- Cause of the emergency
- Action taken to prevent a reoccurrence
- Roles and responsibilities

### Plan Revision

In addition, the MWHC Project Manager and Safety Supervisor shall review and revise the Emergency Response Plan as necessary based on the review of the response and changes will be made to better reflect the requirements of the project.

### Follow Up

Before normal site activities are resumed, personnel under the direction of the Emergency Coordinator will prepare all equipment necessary to handle another emergency. This will include restocking all equipment and supplies, replacing or repairing damaged equipment, and cleaning and refueling equipment for future use.

## **6.13 NOTIFICATION PROCEDURES**

In the event of a site emergency in which an outside agency (USACE, police, fire, EMS) is notified or the occurrence of incidents that requires reporting to OSHA or US EPA, the MWHC Project Manager and the USACE representative shall be immediately notified.

The MWHC Safety Supervisor shall prepare a written notification within 24 hours of the incident. The report shall include the following items:

- Name, organization, telephone number, and location of the Contractor
- Name and title of the person(s) reporting incident
- Date and time of incident
- Location of incident
- Brief summary of incident giving pertinent details including type of operation ongoing at time of the incident.
- Cause of incident, if known
- Details about injuries (number injured, type of injuries etc.)
- Details of any existing chemical hazard or contamination
- Estimated property damage
- Nature of damage; effect on contract schedule

- Actions taken to address root cause and prevent recurrence.
- Other damage or injuries sustained (public/private)
- Agencies notified

#### Oil and Hazardous Material

In the event of a release of oil or hazardous materials, subcontractors (responsible parties) are responsible for notifying local, state and federal environmental agencies.

The guideline below should be used to determine if and when an accidental release of oil or hazardous material is reportable to outside authorities.

- The release posed or poses any potential threat to human health outside the facility.
- The release poses a threat to the air, land, or waters (ground and surface) of the state in which the spill occurred. This includes releases that occur inside a facility.
- The discharge of oil is greater than 2.5 gallons or release of hazardous material equals or exceeds the reportable quantity (RQ value). RQ values can be obtained by contacting the US EPA or the Nevada Department of Environmental Protection.
- The accidental release requires a response by off-site agencies (e.g. fire- department or response contractor).

In the event of an accidental release of oil or hazardous materials meeting the notification criteria, the following local, state and federal agencies shall be notified:

USEPA National Response Center	(800) 424-8802
USACE – Brad Jones (for GB)	(402) 221-4488
USACE – Bruce Jordan (for EJ)	(505) 342-3427

Where the above-cited agencies have to be notified, the following information will be provided:

- Caller's Name
- Site Address:
- Location of spill or release (e.g. bodies of water)
- Date, time and type of incident (e.g. spill or fire)
- Quantity and type of hazardous materials involved
- Duration of release and corrective actions being taken
- Estimated quantity and disposition of recovered materials
- Extent of injuries if any

As required by the agencies a written notification of the release will be sent to the local, state and federal agencies within 15 days or soon if required by the agency. If the MWHC prepares the written notification, the Legal Department shall review it.

In addition, the owner of the pollutant shall be contacted and the person having control over the pollutant shall be contacted. This could be a variety of people depending on the substance spilled. For example, if a tank full of diesel owned by a contractor were to break open and spill, then the contractor should be contacted.

#### **6.14 EMERGENCY CONTACTS**

A list of emergency telephone numbers (USACE, police, fire, rescue, etc) and non-emergency telephone numbers shall be posted on site. Copies of the telephone list will be provided to subcontractors. In this area 911 service is available to notify police, fire, rescue, etc., of an emergency.

##### **US Army Corps of Engineers**

USACE – Brad Jones (for GB) (402) 221-4488  
USACE – Bruce Jordan (for EJ) (505) 342-3427

##### **US Bureau of Land Management**

BLM – Lynn Bjorklund (775) 289-1893  
Ely BLM Radio Frequency 169.775 (transmit and receive)  
Elko BLM Radio Frequency 169.400 (transmit and receive)

##### **Police**

Emergency: 911  
White Pine County Sheriff Department: (775) 289-8808

##### **Fire**

Emergency: 911  
White Pine County Emergency (775) 289-9111

##### **Medical**

William Bee Ririe Hospital (775) 289-3001  
White Pine County Sheriff and Ambulance (775) 289-4833  
Elko General (775) 738-5151  
University of Utah (Salt Lake City, UT) (800) 453-0120  
Burn Center – University of Utah (800) 581-2700

##### **Air Ambulance**

Access Air (Elko, NV) (775) 738-3493  
LDS Life Flight (Salt Lake City, UT) (801) 321-1234  
University of Utah (Salt Lake City, UT) (800) 453-0120



## **6.15 INCIDENT RESPONSE PROCEDURES**

The USACE RAMS reclamation project has been designed to prevent and minimize any threat to the environment, personnel and the general public from unplanned, sudden or gradual releases of hazardous substances or emergencies.

It is the responsibility of all personnel to recognize through self-inspection and informal work site inspections, a situation that may pose a threat to the environment or personnel. When a situation is observed, it shall be immediately corrected.

### **6.15.1 Fire/Explosion**

In the event of a fire, personnel shall sound the fire alarm and evacuate the area. However, if a person believe that the fire can be extinguished with a portable extinguisher, they should proceed to do so. If a fire can not be extinguished in 30 seconds using a portable fire extinguisher the area shall be evacuated and the local emergency response authorities and the USACE notified. Regardless of extinguishing efforts, the USACE office shall be notified. The response to a fire is as follows:

- Call the local authorities and the USACE.
- Evacuate the affected area or initiate evacuation by verbally warning others. Do not return to burning or smoked-filled areas.
- Use handheld extinguishers only to clear a path of escape.
- Report to the designated assembly area.
- Dispatch a person to greet the local authorities and lead them to the scene.

### **6.15.2 Release of Oil or Hazardous Materials**

In the event of an oil or hazardous material release that exceeds normal operation levels (incidental release), the parties responsible for the release are responsible for initiating containment or clean-up. All releases will be contained as necessary (if larger than an incidental spill) and cleaned up in a timely manner. This clean up may require the services of an outside contractor.

The cause of the release shall be investigated to prevent future occurrences. The response for a release of potentially hazardous material entails the following:

- Determine the nature of the substance released.
- Eliminate all sources of ignition.
- Isolate the affected area or initiate area evacuation.
- Stop or contain the flow of the material from the source if this can be done safely.

- Following the procedures and using the protective equipment as indicated by the Material Safety Data Sheet (MSDS) or as directed by the site Safety Supervisor, contain the release to the smallest area possible and initiate cleanup.
- Dispose of all residues in accordance with the MSDS.

When on-site efforts cannot mitigate the hazard in a timely manner or the material poses a fire or explosion hazard or is a threat to public safety, the site and surrounding area shall be evacuated and the local emergency response authorities and the USACE shall be immediately notified.

### **6.15.3 Medical Emergency Response**

The term “medical emergency” means different things in different contexts. In regards to a person, a medical emergency is any life-threatening condition that requires immediate medical intervention to restore breathing, control bleeding, restore circulation, or prevent shock. In regards to incidents on the job, a medical emergency is also an event in which two or more people receive injuries as the result of a single incident.

The immediate response to either type of medical emergency is as follows:

- Take control of the situation.
- Ensure personal safety and the safety of others.
- Assist and evaluate the victim(s). Do not try to move the victim(s).
- Direct someone to call the White Pine County Emergency response authorities.
- Dispatch a person to greet and lead the emergency personnel to the scene.
- Do not attempt to perform any type of technical rescue.

In the event that a person is trapped, unconscious, or otherwise unable to exit the scene, a decision whether or not to attempt a rescue with on-site resources shall be made. This decision will be based on the location of the person, seriousness of the injury, and mechanism of injury. In addition, the decision to initiate a rescue will be based on the potential risk to rescuers, victim and the likelihood of rescue success.

### **6.15.4 Severe Weather**

#### Thunderstorms and Short-Duration Windstorms

The following actions should be taken to secure the project site whenever there is a threatening storm that includes lightning or the chance of winds over 40 miles per hour:

- Secure all loose materials, metal toolboxes, trashcans, etc.
- Stop all work and bring all personnel indoors (if possible) when lightning is within one mile of the site (five seconds or less from flash to thunder).

- Shut down generators and all electrical motors in an orderly manner to protect the equipment from electrical surges and abrupt power loss.
- Move all personnel off crawler-type equipment and boom equipment. Lower crane booms.

### **6.15.5 Contact with Utilities**

In the event that utilities are contacted, the following procedures apply:

#### Electrical Strike

- Personnel in the vicinity of the incident shall not touch or come near downed powerlines. If a machine (crane or other equipment) becomes energized by an electrical utility, all personnel surrounding the machine shall leave the area immediately. Notice: **DO NOT TOUCH THE MACHINE!**
- If the machine is energized, the operator should remain on the machine and avoid moving so as not to change their body position until the electric power has been turned off. The operator may choose to move the machine to break contact with the electric power. The operator should follow the manufacturer's procedure to determine if the machine is electrically charged before attempting to dismount the machine. If the machine catches fire the operator should jump away from the machine, being careful not to touch the machine.
- If persons are exiting the area of an energized machine, it is advised that they should shuffle their feet while walking away or hop away from the machine until they reach a safe area. Gradient electric current could travel up one leg and down the other if feet are apart (from different voltage potential in the soil).
- Call 911, the USACE and the electric utility company.
- Barricade the area to prevent personnel from entering the incident area.

Notice: **MEDICAL ATTENTION CANNOT BE GIVEN UNTIL THE POWER IS SHUT OFF.**

#### Gas Line Strike

- Shut down all engines and eliminate all sources of ignition. Do not attempt to dig or reverse boring machines to break contact, as further movement may cause a spark.
- Evacuate the area immediately. Keep all personnel upwind and away from the incident area in case the gas ignites.
- Contact the gas company to have the gas shut off. Contact the local US Coast Guard, fire department and the MWHC Project Manager.

Fiber-Optic Strike

- Do not look into the cut ends of the cable. This can cause severe eye damage.
- Stop machine operation. Contact the utility owner and the MWHC Project Manager immediately.

ATTACHMENT A

ACTIVITY HAZARD ANALYSIS

## Instructions for the use and preparation of the Activity Hazard Analysis

**Activity Hazard Analysis Requirements:** The Activity Hazard Analysis (AHA) is a documented process by which the steps (procedures) required to accomplish a work activity are outlined, the actual or potential hazards are identified, and measures for the elimination or control of those hazards are developed.

The AHA makes the Health and Safety Plan (HSP) job specific, addresses work to be performed by subcontractors, and identifies measures to be taken by the contractor to control hazards.

Work will not begin on the work activity (feature of work) until the AHA for that activity has been accepted and discussed with all who are engaged in the performance of that activity. The AHA would initially be reviewed during the Preparatory Phase meeting to ensure it adequately addresses the work to be performed. If changes or additions are necessary they are incorporated into the document at that time. The AHA should then be discussed with all workers actually performing the work. This can be accomplished as part of a tailgate safety meeting prior to commencing the work. The Initial Phase inspection would then verify all actions needed to eliminate or minimize the hazards are being implemented. If not then corrective actions would be taken. Daily follow up inspection are then used to verify the work is being performed in accordance with the accepted AHA and any additional agreements/changes made during the preparatory and initial phase inspections.

Activity Hazard Analysis Form is to be used by all contractors and personnel performing work for MWHC. Specific instructions for the preparation of this document are as follows:

- A. Date Prepared: Self-Explanatory
- B. Project: This is the overall project or contract description
- C. Job: This is the feature of work for which the AHA is prepared
- D. Prepared By: Self-Explanatory
- E. Reviewed By: Self-Explanatory
- F. Recommended Protective Clothing and Equipment: Self-Explanatory
- G. Job Steps: This column identifies the principal steps, and the sequence of the work, for the respective feature of work being analyzed
- H. Hazards: This column identifies the potential safety and/or health hazards for each job step
- I. Actions to Eliminate or Minimize Hazards: This column identifies the actions that are to be taken to eliminate or minimize each hazard identified for each job step.
- J. EM385-1-1 (Para Ref): This column is used to identify the reference(s) from the Corps of Engineers *Safety and Health Requirements Manual*, EM385-1-1, where applicable, for each of the respective actions to be taken.

The Job Steps, Hazards and resultant Actions portion of the form is to use a “cascading” type of approach. That is, for each Job Step, there should be multiple Hazards, and for each Hazard there should be multiple actions to be taken.

The last page of the form includes three columns to record:

A. Equipment to be Used: Self-Explanatory – Identify the equipment to be used in performing the feature of work being analyzed. Consider and include as appropriate, hand tools, specialty equipment, and all mechanical equipment.

B. Inspection Requirements: Identify the inspection requirements for each piece of equipment. Ensure calibration, start up, daily, weekly, monthly, etc., requirements are identified for each piece of equipment.

C. Training Requirements: Identify the training required to operate the respective piece of equipment. The training should include licensing type training and all safety and health training that would be applicable to the equipment being used. If special training is required to conduct the inspections, this should also be identified.

The Risk Assessment portion of the form is to be used primarily to evaluate what the risk is for performing the work. This is a subjective evaluation of the actions taken to eliminate or reduce hazards for the feature of work.

In performing this risk assessment the probability of an injury will be determined as either Frequent, Likely, Occasional, Seldom or Unlikely. Then the severity of an injury will be determined as either Catastrophic, Critical, Marginal or Negligible. Based on the probability and severity determinations, a Risk Assessment Code of either Extremely High Risk (E), High Risk (H), Moderate Risk (M), or Low Risk (L) will be assigned.

A. If the Risk Assessment indicates a Low Risk for the activity (feature of work) then the AHA is considered acceptable for that feature of work.

B. If the Risk Assessment indicates a Moderate Risk for the activity (feature of work) the AHA is considered acceptable for that feature of work with approval from the Resident or Area Engineer.

C. If the Risk Assessment indicates a High Risk for the activity (feature of work) the AHA is considered acceptable for that feature of work with approval from the MWHC Safety Manager.

D. If the Risk Assessment indicates an Extremely High Risk for the activity (feature of work) the AHA is considered acceptable for that feature of work with approval from MWHC Corporate Safety.

High and Extremely High Risk Assessments should be cause for rejection of the AHA. The AHA should be returned to the contractor to further define what actions are to be taken to eliminate or minimize the hazards to acceptable levels.

**Conclusion:** The purpose of the Activity Hazard Analysis and Risk Assessment process is to provide for planning and preparation, prior to the conduct of work, to ensure the work can be performed safely. The AHA also provides a means to communicate the hazards, and actions to eliminate or minimize the hazards, to the actual work force performing the work.

The AHA must be prepared by the contractor, accepted by MWHC, communicated to the workforce, and then monitored throughout the life of the work. If we fail in any one of these areas people can get seriously hurt or killed.

## **RISK ASSESSMENT DEFINITIONS:**

### **SEVERITY:**

Catastrophic – Mission failure, death or permanent disabling injury, damage to property >\$200K.

Critical – Major mission degradation, severe injury, occupational illness or major system damage.

Marginal – Minor mission degradation, injury, minor occupational illness, or minor system damage.

Negligible – Less than minor mission degradation, injury, occupational illness, or minor system damage.

### **PROBABILITY:**

Frequent – Occurs often in the life of a system. Continuously experienced.

Likely – Occurs several times in the life of a system. Occurs frequently.

Occasional – Will occur in the life of the system. Occurs sporadically.

Seldom – Unlikely but can expect to occur in the life of the system. Occurs seldom.

Unlikely – Unlikely but could occur in the life of a system. Occurs very rarely.



# ACTIVITY HAZARDS ANALYSIS

Date Prepared: \_\_\_\_\_

Project: \_\_\_\_\_

Prepared By: \_\_\_\_\_

Job: \_\_\_\_\_

Reviewed By: \_\_\_\_\_

Risk Assessment Code (RAC):

Recommended Protective Clothing & Equipment:

E

E = Extremely High Risk  
 H = High Risk  
 M = Moderate Risk  
 L = Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
Severity	Catastrophic	E	E	F	H	M
	Critical	E	H	F	H	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	(REF)
A	B	C	D

# ACTIVITY HAZARDS ANALYSIS

Date Prepared: \_\_\_\_\_

Project: \_\_\_\_\_

Job: \_\_\_\_\_

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<p style="text-align: center;"><b>G</b></p>	<p style="text-align: center;"><b>H</b></p>	<p style="text-align: center;"><b>I</b></p>

ATTACHMENT B  
**Safety Performance Report**

**MONTHLY SUBCONTRACTOR SAFETY REPORT**

**INSTRUCTION:** This report must include sub's subcontractors. The report must be submitted to the MWH representative by second workday of the new month.

**SUBCONTRACTOR:** \_\_\_\_\_

**PROJECT NAME:** \_\_\_\_\_

**NAME OF SUPERINTENDENT:** \_\_\_\_\_

<b>REPORTING MONTH</b>	
<b>FIRST AID CASES</b>	
<b>OSHA RECORDABLE INJURIES</b>	
<b>LOST WORKDAY CASES</b>	
<b>Days Worked</b>	
<b>TOTAL HOURS WORKED</b>	

**BRIEF DESCRIPTION OF RECORDABLE INJURIES**

Blank area for brief description of recordable injuries.

**THIS REPORT WAS PREPARED AND SUBMITTED BY:** \_\_\_\_\_

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

# ATTACHMENT C

## Personal Safety and Health Acknowledgment Form

# Safety and Health Acknowledgment

Name \_\_\_\_\_ Date: \_\_\_\_\_

SSN: \_\_\_\_\_ Employer: \_\_\_\_\_

Date Completed: \_\_\_\_\_ Instructor: \_\_\_\_\_

This is to acknowledge that I have received Health and Safety orientation for the Golden Butte/Easy Junior Reclamation Project. I have received the following instruction as applicable to my job duties and had the opportunity to ask questions.

Y	NR		DATE
<input type="checkbox"/>	<input type="checkbox"/>	General project safety policy to conduct work in a safe manner.	_____
<input type="checkbox"/>	<input type="checkbox"/>	Site conditions and control of hazards on the project site.	_____
<input type="checkbox"/>	<input type="checkbox"/>	Review of the HSP and the availability of Health and Safety Plan.	_____
<input type="checkbox"/>	<input type="checkbox"/>	Project drug and alcohol policy.	_____
<input type="checkbox"/>	<input type="checkbox"/>	Personal protective equipment requirements.	_____
<input type="checkbox"/>	<input type="checkbox"/>	How to contact emergency response and emergency procedures	_____
<input type="checkbox"/>	<input type="checkbox"/>	The location of first-aid and fire protection equipment.	_____
<input type="checkbox"/>	<input type="checkbox"/>	Reporting near misses, incidents or accidents.	_____
<input type="checkbox"/>	<input type="checkbox"/>	Hazard communication and review of MSDS relevant to work.	_____

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
INSTRUCTORS SIGNATURE

## EMERGENCY CONTACT

Name to contact in case of an emergency: \_\_\_\_\_

Telephone (s): \_\_\_\_\_

ATTACHMENT D  
Safety Meeting Record Form

<b>FORM 4-2</b>		DATE:
<b>SAFETY MEETING RECORD</b>		
PROJECT NAME:		JOB NO.:
NUMBER PRESENT:	NUMBER ABSENT:	MEETING CONDUCTED BY:
PRESENTATION	DISCUSSION OF SAFE/UNSAFE WORK PRACTICES, MATERIALS, JOB PRECAUTIONS, HAZARDS, EQUIPMENT FAMILIARIZATION, ETC.	
EMPLOYEE FEEDBACK	COMMENTS, QUESTIONS, COMPLAINTS, ETC.	
CORRECTIVE ACTION	KNOW PLANS FOR CORRECTION, PARTS ON ORDER, ITEMS TO BE DISCUSSED WITH PROJECT MANAGER AND CORRECTION OF ITEMS PREVIOUSLY SUBMITTED	
COMMENTS		
SUPERVISOR		PROJECT MANAGER
HEALTH & SAFETY SUPERVISOR		Have Employees attending sign on reverse side. Forward a copy to the local Safety Dept.



**FORM 4-2**  
**SAFETY MEETING RECORD (Continued)**

**TO BE SIGNED BY ALL EMPLOYEES ATTENDING MEETING**


**LIST ALL EMPLOYEES ABSENT FROM MEETING**


# ATTACHMENT E

## MWHC PROCEDURES



**MWHC HEALTH AND SAFETY PROCEDURES**

Revision: 1  
Issued: 04/04

**02.01 INCIDENT ANALYSIS AND REPORTING**

Page 1 of 8

**1.0 OBJECTIVE**

MWH Constructors, Inc. (MWHC) intends to minimize incidents to the fullest extent possible through the development and implementation of safe operating procedures, employee safety training, and jobsite safety assessments. In the event an incident occurs, it is necessary that a thorough investigation be conducted to determine the contributing factors. When contributing factors are determined, system deficiencies may be identified and can be then be corrected to prevent similar incidents from reoccurring.

**2.0 PURPOSE**

MWHC adheres to the concept that incident investigation is an integral part of the Company’s health and safety policies, procedures, and programs. Incident investigation is a monitoring function that occurs after the hazard control system has broken down. No amount of investigation can reverse an incident; nevertheless, incident investigation is a means to learn from mistakes in order to improve the health and safety program.

**3.0 DEFINITIONS**

An incident is a natural or manmade occurrence that has a potential impact on the wellbeing of a person (either an MWHC employee or another person), the project, the project’s schedule, property, or the environment. Incidents include but are not limited to personal injury and illness, near misses, fires, utility strikes, vandalism, equipment failure and spills and leaks.

A near miss incident is an occurrence in which the consequences did not impact a person’s wellbeing or cause any physical damage; however, the occurrence did have the potential to cause personal injury or illness or physical damage.

An accident is an “act of God” or an event with unknown causes. By their very definition, accidents are very infrequent occurrences on MWHC projects.

Because of the infrequency and unpredictable nature of accidents, the rest of this procedure will focus on incidents.

**4.0 REPORTING PROCEDURES**

All incidents, no matter how minor, are to be reported immediately (within 24 hours) by employees to their immediate supervisor or manager. Failure to make a timely report may result in disciplinary action.

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*Richard A. Hanes*

CHECKED BY:

APPROVED BY:

*MB MacLean*



**MWHC HEALTH AND SAFETY PROCEDURES**

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**02.01 INCIDENT ANALYSIS AND REPORTING**

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Supervisors shall report all lost-time injuries and illnesses, deaths, hospitalizations, and incidents that cause serious damage (those causing over \$1000 in property damages) within one (1) hour of the time that they received notification to their Regional Manager, their Program Manager, and the Health and Safety Director.

False claims of occupational injury or illnesses can result in employment discharge.

**5.0 RESPONSIBILITIES**

**5.1 EMPLOYEES**

All employees shall report any incident, and injury or illness to their immediate supervisor within 24 hours. If their immediate supervisor is not available, they shall make their report to the site Program Manager.

**5.2 SUPERVISORS**

Supervisors are responsible for ensuring that all incidents are reported immediately, subsequently documented, and investigated so that corrective action can be initiated to prevent a reoccurrence. The Supervisor shall facilitate and personally assist in the investigation of all incidents. Documents pertaining to an incident analysis must be complete and accurate.

Supervisory personnel shall notify the Program Manager, Regional Manager, and Health and Safety Director of all reported incidents within 1 hour of the time that they learn of the incident.

Supervisors shall submit a monthly safety report that records project-related incidents and the total project labor hours lost because of these incidents to the Health and Safety Director.

**5.3 SITE HEALTH AND SAFETY SUPERVISOR**

The site Health and Safety Supervisor shall confirm that injuries and illnesses are properly recorded on the project's Occupational Health and Safety Administration (OSHA) log of work related injuries and illness (OSHA Log). After reviewing incident documents, the site Health and Safety Supervisor shall recommend corrective action and follow up to verify that it is implemented.

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**MWHC HEALTH AND SAFETY PROCEDURES**

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**02.01 INCIDENT ANALYSIS AND REPORTING**

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**5.4 HEALTH AND SAFETY DIRECTOR**

If necessary, the Health and Safety Director will conduct an independent analysis of an incident, and shall prepare a narrative report of the findings. The report will be submitted to the Regional Manager, the Director of Operations, and the President of MWHC. The Health and Safety Director is responsible for notifying the Human Resource Manager of all potential workers' compensation claims and the Corporate Risk Manager of all potential third party claims using the forms available from the Risk Management Office.

After consulting with senior management (the President, the Director of Operations, and the Legal Department), the Health and Safety Director is responsible for notifying OSHA within eight (8) hours of any incidents involving a fatality or the hospitalization of three (3) or more employees, as required by 29 CFR 1904.8.

The Health and Safety Director shall maintain the corporate OSHA Log, distribute it to regional offices as necessary, and analyze all incidents and data to make informed decisions regarding incidents, investigation procedures, corrective actions, and disciplinary procedures.

**5.5 PROGRAM DIRECTORS**

The Regional Manager shall appoint an Administrative Assistant to maintain the regional and project OSHA Logs, and shall ensure that the Health and Safety Director, the Director of Operations, and the President are notified of all lost-time incidents, deaths, hospitalizations, and incidents causing serious damage (those causing over \$1000 in damages). In addition, the Regional Manager shall notify the Legal Department, the Corporate Risk Manager, and Public Relations of deaths, multiple hospitalizations, and high-profile incidents and incidents that may result in a claim filed against MWHC.

The Program Manager or Supervisor shall be responsible for notifying the client's representative of incidents involving injuries more serious than first-aid cases.

**6.0 OCCUPATIONAL INJURY AND ILLNESS**

The Occupational Injury/Illness Report (Form AI-1, Attachment A) shall be completed for all occupational injuries or illnesses, and shall be signed by the injured or ill employee and supervisory personnel or a safety official. The report shall be completed within twenty-four (24) hours of an injury or knowledge of an illness.

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**02.01 INCIDENT ANALYSIS AND REPORTING**

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The employee filling out the report shall describe, in his or her own words, the contributing factors of the event and resultant injury or illness. In the event that the employee is unable to assist with the preparation of the report, supervisory personnel shall complete the report to the best of their ability, by using facts gleaned from the incident analysis and from witnesses. The supervisor shall fax or otherwise submit a copy of the report within one (1) workday to the Health and Safety Director and the Regional Manager. In the event of a fatality or serious injury a copy of the report shall be sent to the Legal Department. The original report shall be retained on the jobsite.

The Occupational Injury/Illness Report shall be completed for all work-related occurrences including but not limited to the following:

- An injury or illness involving muscles and joints as the result of repetitive motion
- An injury or illness that requires first aid or medical treatment
- Loss of consciousness by an employee
- Death of an employee
- Back injuries
- Chemical exposures

**7.0 MEDICAL AUTHORIZATION**

The Medical Authorization Form (AI-2, Attachment B) shall be completed whenever an employee is medically evaluated or given medical treatment at a health care facility, such as a hospital, clinic, or doctor's office for an injury or illness that is the result of an incident. The site Health and Safety Supervisor or other supervisor personnel shall complete the upper portion of the form, and the health care provider shall complete the lower portion. The employee shall return the original form to supervisory personnel before returning to work or within twenty-four (24) hours of a lost-time incident.

A copy of the Medical Authorization Form shall be forwarded to the Health and Safety Director and the Regional Manager. The original form shall be retained in the jobsite files.

**8.0 INCIDENT ANALYSIS**

All incidents, no matter how minor, are subject to thorough analysis. Reasonably, an incident causing death or serious injury will require a more thorough analysis than one resulting in a first-aid case. Any near-miss incident that might have caused harm and steady reoccurrence of minor injuries (first-aid cases) also requires an incident analysis.

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**MWHC HEALTH AND SAFETY PROCEDURES**

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**02.01 INCIDENT ANALYSIS AND REPORTING**

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Supervisory personnel shall initiate the analysis as soon after the incident as possible, with the assistance of the Health and Safety Supervisor.

The Supervisor's Incident Analysis Report (Form AI-3, Attachment C) shall be completed for occupational injuries and illnesses, deaths, and near-miss events. The initial paperwork shall be completed, with the Supervisor's signature, within one (1) workday. The Supervisor shall fax or otherwise submit a copy of the report to the Health and Safety Director and the Regional Manager.

It may take several days to conduct a thorough investigation; nonetheless, very likely, it will be possible to complete an incident report within one day. A large majority of investigations can be completed within 3 or 4 days.

The original report shall be retained at the jobsite.

Based on the severity and nature of the incident, the following action must be taken by supervisory personnel or the Health and Safety Supervisor.

- Stabilize the incident scene; remove bystanders and co-workers and secure the area.
- Do not disturb the scene until the investigation is completed.
- As appropriate, notify the client representative or local emergency response agency. (Note: In the event of a fatality, the local police should be called in to investigate.)
- Photograph the incident scene from various angles.
- Obtain the names and addresses of witnesses.
- Gather and retain evidence. Note any evidence collected by outside investigators.
- Record the make, model, serial number, and owner's name of any equipment in use that may have contributed to the incident.
- Take physical measurements as necessary.
- Obtain copies of reports generated by outside investigators.
- The Health and Safety Director or Legal Department shall be notified before information is released about the incident to sources outside the company.

**9.0 MOTOR VEHICLE INCIDENT REPORTING**

The Motor Vehicle Incident Report or Insurance Carriers Form shall be completed for all motor vehicle incidents that occur, on or off the job, that involve an MWHC leased or owned vehicle. The Motor Vehicle Incident Report shall be completed within twenty-four (24) hours of the incident.

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**02.01 INCIDENT ANALYSIS AND REPORTING**

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The driver shall immediately report all motor vehicle incidents to the Health and Safety Director, supervisory personnel, or lease agent. As required, the responsible parties shall complete the Occupational Injury/Illness Report.

**10.0 INCIDENT REPORTING**

Incidents that must be reported include but are not limited to near-misses, fires, utility strikes, vandalism, equipment failure, and spills and leaks. Supervisory personnel will initiate the investigation as soon after the incident as soon as possible with the assistance of the Health and Safety Supervisor. Within one working day, the Supervisor shall fax or submit a copy of the report (AI-4 Incident Report, Attachment D) to the Health and Safety Director and the Regional Manager. The original report shall be retained on the jobsite.

**11.0 SUBCONTRACTOR INCIDENT ANALYSIS**

All subcontractors are responsible for analyzing incidents involving their employees or their company property. It is the responsibility of the MWHC supervisor to ensure that subcontractors submit copies of completed incident report forms to MWHC.

Subcontractors shall immediately report incidents in the manner described in the sections below.

**11.1 SERIOUS INCIDENTS**

It shall be the subcontractor's responsibility to provide or obtain appropriate medical and emergency assistance and notifications (i.e., law enforcement agencies, family members, etc.) unless other arrangements have been made and documented. Except for rescue and emergency measures, the scene of the incident shall not be disturbed, nor related operations resumed, until authorized by MWHC and other proper authorities. The subcontractor shall assist and cooperate fully with MWHC and other authorized parties conducting an analysis of the incident, and shall provide all personnel and data and other information pertinent to the analysis.

The subcontractor shall conduct a separate and complete independent analysis of the incident, and shall submit a comprehensive report of findings and recommendations for making improvements to MWHC.

**11.2 OTHER-THAN-SERIOUS INCIDENTS**

Immediately after arrangements for required medical assistance have been made, the subcontractor's safety representative shall analyze the incident. The subcontractor shall submit to MWHC, a completed incident analysis report for all personal injuries and a

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*Richard A. Hanes*

CHECKED BY:

APPROVED BY:

*[Signature]*





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**02.01 INCIDENT ANALYSIS AND REPORTING**

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comprehensive narrative report for property damage within one (1) workday following the incident.

**11.3 POTENTIALLY SERIOUS INCIDENTS**

The subcontractor's equipment and work site shall remain secured until the subcontractor has completed an incident analysis acceptable to MWHC. The subcontractor shall provide to MWHC a detailed written analysis within one (1) workday following the incident.

**12.0 COMMUNICATIONS**

Under no circumstances may site personnel discuss an incident with the media, even if people from the media ask for or demand information. Personnel should not feel obligated, nor is it in MWHC's interest, to speculate on the cause of the incidents, the severity of injuries, or the cost of repairs. Personnel are cautioned that any information given to the media could be constructed as an "official" response from MWHC.

If approached by the media, supervisors are to advise all personnel on site and in regional and program offices, to refer all media inquiries to the MWH Public Relations Department in Pasadena (Cheryl Friedling 626-699-4152) and/or clients authorized representative.

Any decision to respond to the media is at the discretion of the client. Often, clients have public relations spokespersons that address the media, and MWHC must defer to their authority. If a client requests MWHC to provide information to the media, it shall be the responsibility of the MWHC Public Relations Representative to provide this information.

**13.0 POST-INCIDENT REVIEW**

After a recordable injury or serious incident involving either MWHC or subcontractor personnel occurs, the President of MWHC will conduct a post-incident review with the supervisor responsible for the job, the Project Manager, and the site Health and Safety Manager responsible for the project. The post incident review will be conducted in the MWHC President's office on the Saturday following the incident.

It is recognized that the individuals involved in the review who have direct, detailed knowledge of the incident may have the greatest ability to suggest necessary changes to be made in the organization to prevent the incident from reoccurring. With this in mind, the focus of the review will be to determine the following:

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*Richard A. Hanes*

CHECKED BY:

APPROVED BY:

*MB MacLean*



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**02.01 INCIDENT ANALYSIS AND REPORTING**

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- What happened to cause the injury
- How the injury could have been prevented.
- What training is needed to make MWHC's staff aware of the hazard that caused the injury?
- If MWHC's program (safety or contracting) be modified to prevent the incident from reoccurring.

The Regional Office is responsible for the travel costs, which, may be charged to the job as either billable or unbillable costs at the discretion of the Regional Manager.

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*Richard A. Marino*

CHECKED BY:

APPROVED BY:

*MB MacL...*



**INJURY/ILLNESS REPORT**

**Form AI-1**

TYPE OF REPORT  FIRST AID  MEDICAL  LOST TIME  DEATH

MWHC REPORTING OFFICE		PHONE NO.
ADDRESS		
INJURED PERSON'S NAME	IS THE INJURED AN MWHC EMPLOYEE? <input type="checkbox"/> YES <input type="checkbox"/> NO	SOCIAL SECURITY NO.
EMPLOYER'S NAME AND ADDRESS (IF NOT AN MWHC EMPLOYEE)		PHONE NO.
		CONTACT'S NAME
INJURED PERSON'S HOME ADDRESS		
HOME PHONE NO.	BIRTH DATE	SEX <input type="checkbox"/> M <input type="checkbox"/> F
JOB TITLE	JOB BEING PERFORMED AT TIME OF EVENT <input type="checkbox"/> REGULAR <input type="checkbox"/> OTHER (Describe)	
LENGTH OF EMPLOYMENT Months ____ Years ____	HOUR BEGAN WORK <input type="checkbox"/> AM <input type="checkbox"/> PM	LENGTH OF EMPLOYMENT ON THIS JOB Days _____ Weeks _____
DATE OF ACCIDENT	TIME OF ACCIDENT <input type="checkbox"/> AM <input type="checkbox"/> PM	SUPERVISOR IN CHARGE OF JOB AT TIME OF ACCIDENT
DATE OF THIS REPORT	ACCIDENT WAS REPORTED TO SUPERVISOR	DATE TIME <input type="checkbox"/> AM <input type="checkbox"/> PM
DID INJURY OCCUR ON COMPANY PROPERTY? <input type="checkbox"/> YES <input type="checkbox"/> NO	EXACT LOCATION (Project name, address, location)	
HOW DID INJURY/ILLNESS OCCUR? WHAT WAS THE PERSON DOING BEFORE AND AT TIME OF THE INCIDENT ? (Be specific.)		
WITNESS NAME	ADDRESS	PHONE NO.
WITNESS NAME	ADDRESS	PHONE NO.
FIRST AID PROVIDED <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> REFUSED	BY WHOM	INITIALS OF INJURED IF FIRST AID WAS REFUSED
ATTENDING PHYSICIAN	ADDRESS	DATE
HOSPITAL/CLINIC	ADDRESS	DATE
DESCRIBE THE MEDICAL OR FIRST AID TREATMENT GIVEN		
TYPE OF INJURY/ILLNESS (See code on back of form.)	WORK INJURY CLASSIFICATION (See code on back of form.)	
EXTENT OF AND OUTCOME OF INJURY OR ILLNESS (Check those applicable.)	PARTS OF BODY INJURED (See code on back of form.)	
<input type="checkbox"/> Employee lost consciousness. <input type="checkbox"/> Follow-up treatment is required. <input type="checkbox"/> Employee will continue to perform job fully. <input type="checkbox"/> Employee will temporarily be assigned to other work. <input type="checkbox"/> Employee is unable to work as of ___/___/___ (date). <input type="checkbox"/> Injury/Illness resulted in death ___/___/___ (date). <input type="checkbox"/> Employee will remain on regular job, but has some restrictions of work or limitation of motion as of ___/___/___ to ___/___/___ (dates).		
SUPERVISOR'S SIGNATURE/DATE	INURED PERSON'S SIGNATURE/DATE	
NAME OF PERSON COMPLETING REPORT (If different from above)	SIGNATURE/DATE	

**WORK INJURY CLASSIFICATIONS**

**STRUCK BY OBJECT**

- 01 Hand tool or machine in use
- 02 Falling or flying object
- 03 Tipping, sliding, or rolling object
- 04 Object handled by other person
- 05 Other (describe on form)

**STRAIN**

- 11 In lifting
- 12 In using tool or machine
- 13 In pushing or pulling
- 14 In holding or carrying
- 15 In reaching and bending

**FALL OR SLIP**

- 21 On same level
- 22 To or from different levels (stairs, dock, scaffold, ladder, etc.)
- 23 Slip, loss of balance (no contact)

**STRIKING AGAINST OBJECT**

- 31 Object being handled
- 32 Contact with sharp object
- 33 Stationary object
- 34 Moving parts of machine

**CAUGHT IN, ON OR BETWEEN**

- 41 Machine or machine parts
- 42 Other mechanical apparatus
- 43 Objects being handled and other objects
- 44 Other (describe on form)

**CONTACT WITH TEMPERATURE EXTREMES**

- 51 Steam or hot fluids
- 52 Welding flash
- 53 Hot or molten metal
- 54 Frostbite, heat exhaustion, heat stroke, hypothermia, etc.

**INHALATION, ABSORPTION, SWALLOWING**

- 61 Absorption or other skin contact with substance
- 62 Breathing gases, vapors, fumes, or dust
- 63 Swallowing substances
- 64 Poisonous plants

**MISCELLANEOUS**

- 91 Accident involving moving motor vehicle (lift truck, backhoe, etc.)
- 92 Foreign body in eye
- 93 Insect bite
- 94 Animal bite
- 95 Contact with electrical current
- 96 Assault
- 97 Other (describe on form)

**PART OF BODY**

- |                       |                    |
|-----------------------|--------------------|
| 01 Head               | 21 Left hip        |
| 02 Face               | 22 Right hip       |
| 03 Teeth              | 23 Buttocks        |
| 04 Left ear           | 24 Left leg        |
| 05 Right ear          | 25 Right leg       |
| 06 Left eye           | 26 Left knee       |
| 07 Right eye          | 27 Right knee      |
| 08 Neck               | 28 Left ankle      |
| 09 Left shoulder      | 29 Right ankle     |
| 10 Right shoulder     | 30 Left foot       |
| 11 Left arm           | 31 Right foot      |
| 12 Right arm          | 32 Toes-left foot  |
| 13 Left elbow         | 33 Toes-right foot |
| 14 Right elbow        | 34 Chest           |
| 15 Left wrist         | 35 Abdomen         |
| 16 Right wrist        | 36 Groin           |
| 17 Left hand          | 37 Upper back      |
| 18 Right hand         | 38 Middle back     |
| 19 Fingers-left hand  | 39 Lower back      |
| 20 Fingers-right hand | 40 Pelvis          |

**TYPE OF INJURY/ILLNESS**

- 01 Cut
- 02 Bump/bruise
- 03 Puncture wound
- 04 Scratch/scrape
- 05 Strain/sprain
- 06 Muscular/skeletal disorder (carpal tunnel, tendinitis, etc.)
- 07 Hernia
- 08 Fracture
- 09 Dislocation
- 10 Amputation
- 11 Burn-thermal
- 12 Burn-chemical
- 13 Electrical shock
- 14 Foreign body
- 15 Rash/dermatitis
- 16 Dust disease of the lung
- 17 Respiratory conditions due to toxic agent
- 18 Poisoning (lead, carbon monoxide, etc.)
- 19 Disorder due to physical agents (heat stroke, noise, etc.)
- 20 Skin disorder or disease



### MEDICAL AUTHORIZATION

Form AI-2

To: Physician, Hospital, Clinic

Date:

Please render immediate medical treatment to the person named below.

Injured/Ill Person		Date of Injury/Illness			Time of Injury	
Last Name	First Name	Month	Day	Year	Hour	AM/PM
<b>Medical treatment rendered is subject To the provisions of the State Workers' Compensation Act.</b>		<b>Date Injury/Illness Reported</b>			Employee No.	Social Security #
		Month	Day	Year		

Give a brief description of injury/illness.

---



---



---

For our information, we request that the following information be completed and this form given to the injured/ill for return to MWHC. If the person is not return immediately to work, please call

\_\_\_\_\_.

- The person may return to normal work duties at once.
- The person is totally incapacitated at this time
- Person may return to work with the following restrictions:

---



---



---

Patient can return to work on (date) \_\_\_\_\_

Patient can resume regular duties after (date) \_\_\_\_\_

Patient will be re-evaluated on (date) \_\_\_\_\_

Date of next treatment \_\_\_\_\_

I saw the patient on \_\_\_\_\_ (date) and have made the following diagnosis:

---



---



---

Healthcare Providers Signature: \_\_\_\_\_

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

Healthcare Providers Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

**SUPERVISOR'S INCIDENT  
ANALYSIS REPORT**

**AI-3**

MWHC REPORTING OFFICE		NAME OF PERSON	
WORK LOCATION		DATE OF INJURY/ILLNESS	
SUPERVISOR'S NAME		TIME OF OCCURRENCE	
TYPE OF PERSONAL INCIDENT		<input type="checkbox"/> NEAR MISS <input type="checkbox"/> ILLNESS <input type="checkbox"/> FIRST AID <input type="checkbox"/> DEATH <input type="checkbox"/> INJURY	
<b>INCIDENT CAUSE(S)</b>	Task performed at time of incident (Check those applicable.) <input type="checkbox"/> Operating machinery <input type="checkbox"/> Operating hand tools <input type="checkbox"/> Operating power tools <input type="checkbox"/> Material handling <input type="checkbox"/> Maintenance & repair <input type="checkbox"/> Motor vehicle driver, passenger <input type="checkbox"/> Environmental sampling <input type="checkbox"/> Construction activities <input type="checkbox"/> Office, clerical work <input type="checkbox"/> Unknown		Causes (Check those applicable.) <input type="checkbox"/> Improper work procedures <input type="checkbox"/> Taking unsafe position <input type="checkbox"/> Violation of safety practices <input type="checkbox"/> Not using safety equipment <input type="checkbox"/> Defective equipment/tools <input type="checkbox"/> Operation without authority <input type="checkbox"/> Performing unsafe act <input type="checkbox"/> Others (Describe below.)
	DESCRIBE THE CONDITIONS ACTS, AND PRACTICES THAT CAUSED OR CONTRIBUTED TO THIS INCIDENT. (Use additional sheets as required. Include photographs, maps, and drawings if they are available.)		
Name and condition of equipment, material, or tools that caused or contributed to the incident.		What safety equipment was employee using or wearing?	
DESCRIBE WHAT SPECIFIC ACTIONS HAVE BEEN TAKEN OR RECOMMENDED TO PREVENT OR MINIMIZE A RECURRENCE OF THE CONDITIONS, ACTS, AND PRACTICES THAT CAUSED OR CONTRIBUTED TO THIS INCIDENT.			
NAME OF PERSON COMPLETING THE REPORT		SIGNATURE/DATE	

**SUPERVISOR'S INCIDENT  
ANALYSIS REPORT**

**AI-3**



## INCIDENT REPORT

MWHC REPORTING OFFICE		ADDRESS	
PROJECT NAME		ADDRESS	
LOCATION WHERE INCIDENT OCCURRED			
INCIDENT DATE	TIME OF INCIDENT	<input type="checkbox"/> AM <input type="checkbox"/> PM	DATE REPORTED
REPORTED BY/OF		REPORTED TO	
INCIDENT INVOLVED		SUBCONTRACTORS NAME	
<input type="checkbox"/> MWHC/MWH <input type="checkbox"/> Subcontractor <input type="checkbox"/> Client <input type="checkbox"/> Third party		ADDRESS	PHONE NO.
Name, Address, and Telephone Number of Parties Involved or Witnesses			
<b>TYPE OF INCIDENT (Check all that apply)</b> <input type="checkbox"/> Property Damage <input type="checkbox"/> Fire <input type="checkbox"/> Spill/Leak <input type="checkbox"/> Explosion <input type="checkbox"/> Collapse <input type="checkbox"/> Power Outage <input type="checkbox"/> Utility Damage <input type="checkbox"/> Near Miss <input type="checkbox"/> Equipment Failure <input type="checkbox"/> Equipment Damage <input type="checkbox"/> Vandalism <input type="checkbox"/> Theft <input type="checkbox"/> Other			
INJURIES? <input type="checkbox"/> No <input type="checkbox"/> Yes (Complete Injury/Illness Report)		ESTIMATED DAMAGE AMOUNT \$	
DESCRIBE WHAT HAPPENED (Include photos, maps, police/fire reports, etc.)			
CAUSE(S) OF INCIDENT (Primary, secondary, etc.)			
CORRECTIVE ACTION TAKEN			
OUTSIDE AGENCIES NOTIFIED (Agency, date, time, contact, etc.)			
NAME OF PERSON COMPLETING REPORT		SIGNATURE/DATE	





**MWHC HEALTH AND SAFETY PROCEDURES**

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**05.01 DEMOLITION ACTIVITIES**

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**1.0 OBJECTIVE**

It is an objective of MWH Constructors, Inc. (MWHC) to provide a safe workplace for all employees and subcontractors during demolition activities. Any demolition activities performed by MWHC or its subcontractors shall be performed in compliance with this procedure and all applicable health and safety regulations.

**2.0 PURPOSE**

The purpose of this procedure is to give directions for demolition activities in accordance with 29 CFR 1926, Subpart T, and Company policy. MWHC shall not allow employees directly involved with the demolition to be present in areas where demolition activities are occurring. In addition, no employee is permitted in any area where that employee can be adversely affected by demolition operations.

**3.0 DEMOLITION PLANNING AND PREPARATION**

- 3.1 Before the work of a demolition project begins, the work shall be planned in order to safeguard the health and safety of workers at the jobsite. The preparatory planning activities for a demolition involve the overall planning of the job, the methods to be used to bring the structure down, the equipment necessary to do the job, and the measures to be taken to ensure safety. Planning a demolition job is essential for doing the work safely and effectively. Therefore, a competent person experienced in all phases of the demolition work to be performed shall perform all planning.
- 3.2 All required permits shall be obtained and all necessary notifications, including "courtesy notifications" requested by agencies such as state environmental protection agencies, shall be made before demolition activities begin. Clients and local regulatory agencies may require permits for demolition activities, and these should also be obtained before demolition activities begin.
- 3.3 An engineering survey shall be completed before any demolition activities begin. This survey must be completed by a competent person capable of recognizing any potential hazards associated with the structure both before and during demolition. The engineering survey must be written and kept on file at the project site. A sample Engineering Survey form can be found in Attachment A. In especially difficult situations or situations with a high risk of hazards, a professional engineer is required to complete the engineering survey.

Key points of the engineering survey are described in the paragraphs below.

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**3.3.1** The framing floors and walls must be stable enough to withstand the loads that will be imposed on them during demolition activities. This consideration is especially important if interior demolition will be required. Unplanned collapse of any part of the structure is of the utmost concern, because personnel would be exposed to immediate life-threatening danger.

**3.3.2** Adjacent structures must be surveyed to determine if their occupants will be exposed to danger through demolition. In this step of the planning, an assessment must be made of the risk that may exist to the public or other contractors in the area. When other structures are attached or extremely close to the structure to be demolished, extra care and planning will be required.

**3.3.3** In many cases, some form of damage has occurred to the structure that is to be demolished. In these cases, extra planning and precautions are often needed. For example, if a building has been damaged by flooding or fire, shoring and bracing of the structure will be required. The engineering survey must determine the need for such remedies shoring and bracing. The professional engineer must make sure they are in place before the demolition activities are begun.

**3.3.4** Glass windows or other glass items must be identified in the survey.

**3.4** Electric, gas, steam, water, sewer, and septic utilities and all other utilities or services shall be de-energized and physically disconnected before demolition begins. The individual utility companies shall be notified so that they have adequate time to respond.

If it is necessary to maintain any power, water, or other utilities during demolition, the lines shall be temporarily relocated or protected, or both, as necessary. The location of all overhead power sources shall also be determined because they can prove especially hazardous during any machine demolition. All workers shall be informed of the location of any existing or relocated utility service.

**3.5** Vessels, tanks, lines, equipment, and any other potential accumulation point of a process material must be identified and air monitoring or testing, as appropriate, must be conducted. If conditions warrant, purging, ventilation, or abatement shall be undertaken to remove the hazards. The hazards posed by the accumulation of a process material are toxic and combustible atmospheres, the accumulation of flammable substances, and any other recognizable hazard that may occur.

**3.6** Any hazardous material inside of the structure to be demolished shall be identified. Hazardous materials that may be found include asbestos and materials that are

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suspected of containing asbestos, polychlorinated biphenyls (PCBs), lead, or hazardous material left over from processing. These materials must be removed before demolition if the disposal of the demolition material would be affected by the hazardous material. Additional protection of employees may be required if the hazardous materials will remain in place throughout the demolition activities. Any hazardous materials left in place must be noted on the engineering survey.

**4.0 ACCESS AND EXITS**

- 4.1 Appropriate entrances and exits must be in place before demolition begins if employees will be required to enter the structure. For multistory demolition, the requirements of 29 CFR 1926.850(k) must be put into action.
- 4.2 All routes of exit shall be maintained during demolition activities and shall be clearly marked. As necessary, self-illuminating exit signs and arrows pointing to exits shall be used.
- 4.3 A sketch map showing exit points from within the structure shall be posted. All sketch maps shall be updated as demolition activities continue.

**5.0 FIRE PREVENTION**

Because of the high potential for fires at demolition sites, a fire prevention plan must be developed. Key points of fire prevention include the following:

- The local fire department shall be notified of demolition activities.
- The client and fire department shall be notified of any sprinkler system impairments.
- A fire alarm system (e.g., an air horn, two-way radios) shall be available at each project site, and all employees shall be briefed on its use.
- Readily accessible fire-fighting equipment and supplies (fire extinguishers, water supply, etc.) shall be available in the work area.
- All means of access to all fire hydrants shall be kept open, including a clear path from the hydrants to the structure. In the event a fire hydrant is unusable, the local fire department shall be notified and the hydrant shall be tagged out or covered.
- For all hot work, such as torch-cutting or the use of tools that produce sparks, a Hot Work Permit must be issued. (See Procedure 07.02 for the Hot Work Permit.) A fire watch shall be posted during the hot work and for at least 60 minutes after it is completed.

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- A sketch map with the location of fire extinguishers in the area (and in the structure if work will be performed inside) shall be posted. This map may be combined with the sketch map of the location of the fire extinguishers (see paragraph 4.3).
- Fuels and flammable and combustible materials shall be stored away from demolition activities.
- Temporary containers such as fuel cans shall not be permitted inside the structure unless they are stored in a flammable liquid cabinet.
- Temporary heaters must meet the requirements spelled out in 29 CFR 1926.154. As a rule, these heaters must be protected from damage within the structure.
- Propane cylinders shall not be stored in any structure that is being demolished.
- All temporary electrical wiring must be installed by a competent or certified electrician.

**6.0 FIRST AID**

- 6.1** Before the start of the job, local emergency services (ambulance, hospital, clinic) shall be identified and notified of the work in progress and how to access the site.
- 6.2** Routes to the hospital and emergency telephone numbers (physician, hospital, ambulance, etc.) shall be posted on the jobsite and available in company vehicles.
- 6.3** At least two persons on site must have current first-aid/CPR training.
- 6.4** A first-aid kit (a 16-unit kit at a minimum) must be available on the jobsite. Supplies must be in a weatherproof container with individual sealed packages for each type of item. Items must be replaced as they are expended. First-aid kits shall be inspected weekly and records of the inspections shall be maintained with the kits.
- 6.5** A portable eyewash station/drench shower shall be located in the immediate work area where persons could be exposed to hazardous chemicals.

**7.0 SECURITY**

The perimeter of the site or the building itself must be secured at the completion of each shift. A physical barrier shall be constructed to hinder unauthorized visitors from entering the site. Should a locking barrier not be feasible, a security guard is required.

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**8.0 WALKWAYS**

- 8.1** Where temporary walkway are required for the public to prevent exposure from hazards of the demolition activities, they will be placed at an adequate distance and be constructed of suitable materials. This includes providing handrails, fencing, lighting, shields, overhead protection, and any other control necessary for the safe passage of the public.
- 8.2** Stairs within the structure and outside of it must be kept serviceable if employees will use them. This includes regular inspection throughout the demolition of the structure. Stairs deemed to be unusable will be clearly marked and barricaded to prevent their usage. Lighting and appropriate handrails must be maintained throughout the usage of the stairs.

**9.0 FLOOR AND WALL OPENINGS**

- 9.1** Standard guardrail systems or covers shall be used to protect workers from falling into floor openings and to prevent material falling through them. When guardrails are used to secure holes, they must be erected on all unprotected sides or edges. When guardrails are used to secure holes that must be used for the passage of materials, not more than two sides can be protected by movable guardrail.
- 9.2** All other covers shall be capable of supporting, without failure, at least twice the weight that may be imposed on them by workers, equipment, and materials.
- 9.3** Covers shall be secured when installed to prevent accidental displacement by wind, equipment, or workers.
- 9.4** All covers shall be color coded or marked with the word "HOLE" or "COVER" to provide warning of the hazard.
- 9.5** Wall openings and hoist areas shall be enclosed by a guardrail system or equivalent means to prevent workers from going through the opening or material from falling through it. When a guardrail system is used in hoisting areas, a chain, gate or removable guardrail section must be placed across access opening when hoisting operations are not taking place.
- 9.6** When protective systems for floor or wall openings or protective systems for hoist areas have been removed or opened, workers are required to use a personal fall arrest system.

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**10.0 MATERIAL DROPS**

- 10.1** When debris is dropped through holes in the floor to a lower level without the use of chutes, the areas on the lower level where the debris lands shall be enclosed with standard guardrail (or the equivalent) located at least 6 feet back from the opening. Signs warning of the hazard of falling materials shall be posted on both levels. Workers will not be permitted to remove material from the lower level until the dropping of debris from above has stopped.
- 10.2** It is permissible for holes to be used for material drops to be cut into floors, but the requirements of this section must be met. The size of the material drop must not exceed 25 percent of the total floor area.
- 10.3** Where the material is dumped from mechanical equipment or wheelbarrows, a securely attached toeboard or bumper, not less than 4 inches thick and 6 inches high, shall be provided at each opening.

**11.0 DEBRIS CHUTES**

- 11.1** At or near the discharge end of each debris chute, a gate shall be installed to control debris. A worker shall be assigned to control the operation of the gate and the backing and loading of trucks. When operations are not in progress, the area surrounding the discharge end of each chute shall be securely closed off.
- 11.2** Chute openings into which debris is dumped shall be protected by a guardrail system. Any space between the chute and the edge of openings in the floors through which it passes shall be covered over.

**12.0 HOUSEKEEPING**

- 12.1** The inside of structures involved with demolition must have free access ways to exits at all times. Debris must not be allowed to accumulate in work areas and should be removed from the structure into a staging area as soon as feasible. As boards with nails are removed, the nails shall be removed or bent immediately; workers shall not let large quantities of such boards to be collected before they take this safety precaution. Sharp edges on metallic edges shall be smoothed or bent as soon as possible. Trash must not be allowed to accumulate inside the structure.
- 12.2** Torch lines and extension cords shall be run the minimum distance necessary and should not cross over walkways. A rollback shall be done periodically to remove unneeded lines and prevent entanglement.

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**12.3** Access ways must be maintained at all times at the exterior of the structure to be demolished. Segregation piles shall be placed far enough away as not to interfere with the demolition activities and shall always be away from foot traffic areas. Whenever feasible, segregation piles shall be containerized. Material waiting to be shipped or disposed of must always be stacked in a manner to prevent its collapse. Material that cannot be stacked (such as most demolition debris) must not be piled higher than 4 feet.

**12.4** Foot traffic and vehicle traffic should be kept to a minimum around stockpiles.

**13.0 MECHANICAL DEMOLITION EQUIPMENT**

**13.1** Mechanical demolition equipment and its attachments shall be inspected before each shift to verify that it is in safe operating condition.

**13.2** All heavy equipment and service vehicles shall be equipped with a multipurpose fire extinguisher.

**13.3** Employees are required to use seatbelt when operating heavy equipment or other vehicles.

**13.4** Demolition machines (excavators, loaders, etc.) shall be equipped with roll-over protective structures (ROPS) and falling-object protective structures (FOPS), including clear protective shields or window guards. Only machines with fully enclosed caps shall be used. In addition, the machines shall be equipped with audible reverse signal alarm.

**13.5** Skid steer loaders such as Bobcats may not be used for direct mechanical demolition.

**13.6** Where mechanical demolition equipment is used, the number of ground labor personnel shall be kept to a minimum. No employee may work near machines that handle material or are engaged in shearing, bursting, or breaking concrete.

**13.7** As necessary, ground labor shall be

- Provided with brightly colored orange or green construction vests (reflectorized at night).
- Be instructed to stay out of equipment blind spots and to stay clear of material being sheared. (The blind spots for excavators, and cranes are to the operators' right.)

**13.8** Personnel shall not be elevated by booms, buckets, or other attachments.

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**13.9** The equipment operator shall be responsible for the safe operation of his or her equipment and for knowing the location and number of ground personnel. The operator shall be familiar with the blind spots on the equipment and shall avoid making turns in the direction of the blind spot.

**13.10** Cranes and rigging must comply with MWHC policies as outlined in Procedure 4.02, Cranes, of this manual and the regulations of the Occupational Safety and Health Administration (OSHA). The capacity of the crane must be determined before any pick is made, and the crane's capacity shall not be exceeded in any configuration. A lift plan for critical and major lifts shall be drafted and mathematically checked before such picks are made.

**14.0 GENERAL WORK PRACTICES**

**14.1** As demolition proceeds, continuous inspections by a competent person shall be made to determine if all safety precautions are being followed and if additional safety precautions are required. The competent person shall identify existing and predictable hazards in the surroundings and working conditions that are unsanitary, hazardous, or dangerous to employees. The competent person has authorization to take prompt corrective measures to eliminate hazardous conditions, including shutting down hazardous operations.

**14.2** Personal protective equipment (PPE) shall be selected based on the anticipated hazards. The minimum PPE for a demolition job is a hardhat, safety glasses, steel-toed boots, and leather work gloves. Dismantling former process lines may require additional protection, such as eye/face protection and protective clothing.

**14.3** Warning signs noting the danger or potential danger of any particular hazard must be posted at all times, even within the work zone. Signs should be placed where they can be easily seen by any person in the area. It must be emphasized that signs shall be posted warning of *all* hazards, even those that are only potential or intermittent. A sign is not a control of a hazard and should not be treated as such.

**14.4** Dust control is a requirement for all demolition activities. If personnel are required to use water hoses, sufficient water pressure must be used to allow for personnel to be outside of the fall area of the structure or the operating envelop of mechanical equipment.

**14.5** On all demolition projects, 100% fall protection is required when workers must work 6 feet or more above a lower level (see Procedure 7.01, Fall Protection, of this manual).

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- 14.6** Impalement hazards in which an employee can fall onto shall be eliminated or guarded. Where the impalement hazard can not be eliminated or guarded employees shall be protected from the hazard by means of a personal fall arrest system.
- 14.7** Employees are not permitted to walk on debris piles.
- 14.8** The work area shall be adequately illuminated. Generally for construction work, at least 5 foot-candles of light are considered to be adequate. While it is difficult to measure foot-candles on a construction site, the work area can be illuminated with a combination of natural and artificial light in a manner that allows for normal visual conditions.
- 14.9** Scaffolding shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling, and alteration. The competent person shall inspect the condition of the scaffold daily. See Procedure 20.01, Scaffolds, for more details on the requirements of the use and maintenance of scaffolds.
- 14.10** Scissors lifts and manlifts shall be equipped with guardrails, and operators must be familiar with the machines and competent in their use. The work surfaces must be stable, and under no circumstances shall the equipment be used to raise or lower materials or equipment. The manufacturer's recommendations for maximum loads shall not be exceeded, and the manufacturer's other recommendations shall be heeded. These machines must be inspected daily in accordance with the manufacturer's recommendations. (See Procedure 2.02, Aerial Work Platforms, of this manual.)
- 14.11** The number of ground personnel in demolition zones shall be kept to a minimum—ideally zero. Adjoining areas will be vacated as well.

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**MWHC HEALTH AND SAFETY PROCEDURES**Revision: 1  
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**1.0 OBJECTIVE**

All excavations opened by MWH Construction, Inc. (MWHC) must comply with the requirements of this procedure and the requirements of 29 CFR Subpart P "Excavations."

**2.0 PURPOSE**

The intent of this procedure is to prevent incidents involving cave-ins and contact with or damage to underground utilities with the accompanying risk potential for personal injury and property damage.

**3.0 APPLICATION**

This procedure covers excavations and trenches. An excavation is simply defined as a hole left in the ground as the result of removing material. A trench is an excavation with a depth that exceeds the width.

**4.0 EXCAVATION**

**4.1** The following site-specific conditions shall be taken into account before beginning an excavation project:

- Traffic
- Nearness of structures and their conditions
- Soil type
- Surface water and groundwater
- Water table
- Overhead and underground utilities
- Weather

**4.2** Before any excavation begins, the utility companies or their owner's representatives shall be contacted to establish the location of all underground utilities. Most utilities require a 48-hour notice before groundbreaking and are members of a one-call system for locating underground facilities.

**4.3** Where excavations are to be performed in areas known or suspected to contain buried objects (e.g., drums and tanks), the area shall first be surveyed to determine the location of such objects. The suspected area shall be clearly marked.

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- 4.4 All surface encumbrances that are located near the excavation shall be removed or supported if they create a hazard.
- 4.5 Supportive systems such as shoring, bracing, or underpinning shall be provided for the stability of buildings, walls, sidewalks, pavement, and other structures that are adjacent to the excavation area. A registered professional engineer shall design the support systems.
- 4.6 Excavations below the level of the base or footing of any foundation of an adjacent structure or an adjacent retaining wall shall not be permitted unless
- A support system such as underpinning is provided.
  - The excavation is in stable rock.
  - A registered professional engineer determines that the structure will not pose a hazard.

**5.0 PROTECTIVE SYSTEMS**

- 5.1 No employee of MWHC shall enter a vertical excavation greater than 5 feet in depth unless the excavation is made entirely in stable rock, a competent person has examined the ground and found no indication of potential cave-in, or a protective system is used.
- 5.2 The sides of all excavations in which employees are exposed to danger from moving ground shall be guarded by a protective system (sloping, benching, trench boxes, shoring, or other such protection).
- 5.3 Protective systems shall be selected and constructed in accordance with the requirements of Appendices B through D of 29 CFR 1926.652.
- 5.4 All protective systems shall have the capacity to resist, without failure, all loads that are intended, or could reasonably be expected, to be applied to the system.
- 5.5 For excavations over 20 feet in depth, a registered professional engineer shall design the protective system. The design of the protective system shall be in writing. At least one copy of the design shall be maintained at the jobsite during excavation.
- 5.6 The design of a protective system that is drawn from a manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer. Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall be allowed only after the manufacturer issues specific written approval. A manufactured protective system's

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specifications, recommendations, and limitations, and written approvals shall be available on the project site.

- 5.7 Protective systems that are required for specific applications shall be designed and approved by a registered professional engineer. These designs shall be in writing and include a plan indicating the size, type, and configurations of the materials to be used in the protective system. The identity of the registered professional engineer who approved the design shall be recorded on the design. At least one copy of the design shall be retained at the jobsite during excavation.

**6.0 WORKING WITH PROTECTIVE SYSTEMS**

- 6.1 Before and during use, protective systems such as shields (trench boxes) and shoring along with their components shall be inspected in accordance with the manufacturer instructions. Defective or questionable shields, shoring, or components shall not be used.
- 6.2 To limit soil movement in case of a cave-in, the trench boxes or shields must not have any lateral movement when installed. The shield must extend at least 18 inches above the vertical side of the excavation or lower portion of a proper slope. Shields may be a maximum of 2 feet above the bottom of an excavation if they are designed to resist loads at the full depth of the trench and if there are no indications of caving under or behind the shield. The open end of the shield must be protected from exposed excavation walls. To prevent cave-ins, the back walls may be sloped or engineered endplated may be installed, or both, as necessary.
- 6.3 Workers are not allowed in the shield or trench during installation or removal or during any vertical movement of the trench box. When workers are in the trench, they shall remain inside the shield and must leave when the box is moved.
- 6.4 Shoring shall be installed as the excavation proceeds. If there is a delay between digging and shoring, no one shall be allowed to enter the unprotected trench. All shoring shall be installed from the top down and removed from the bottom up. The shoring must extend at least 18 inches above the vertical side of the trench or lower portion of a proper slope. The vertical and horizontal spacing of struts, wales, and sheathing shall be in accordance with Appendix D of 29 CFR 1926.652, a registered professional engineer's specification, or the manufacturer's recommendations. The system shall be inspected frequently when in use.
- 6.5 When workers are in a trench, they shall remain inside the shoring.

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6.6 When the protective system is removed, the excavation shall be backfilled immediately.

**7.0 ACCESS AND EGRESS**

7.1 Whether protected by sloping, shields (trench boxes), or shoring, excavations greater than 4 feet in depth shall be equipped with stairs, ramps, or ladders so that workers can enter and exit safely. The means of access/egress shall be placed as close as possible to the area where personnel are working and never more than 10 feet away. When ladders are used, they shall extend at least 3 feet above the excavation or protective system and shall be tied off at the top.

7.2 Walkways or bridges with standard guardrails shall be installed where personnel are required to cross over an excavation.

**8.0 MATERIALS AND EQUIPMENT**

8.1 The spoils pile shall be placed at one side of the excavation. At a minimum, the toe of the spoils pile shall be at least 3 feet away from the edge of the excavation. The spoils pile shall be moved farther back in proportion to the depth of the excavation. The spoils pile height shall not exceed the depth of the excavation and shall be sloped to prevent the soil and rocks from sliding into the excavation.

8.2 Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face.

8.3 Materials or equipment that might fall or roll into an excavation shall be kept at least 3 feet from the edge of excavations.

8.4 As pipe is placed around a trench, each section shall be blocked or set so that it cannot roll.

8.5 Tools and equipment shall not be thrown into or out of an excavation.

8.6 All employees working in an excavation deeper than 4 feet shall remain in visual or audio contact with a person on top of the excavation. Before equipment is used to deposit material into an excavation, a signal must be given to clear the excavation and for personnel to remain a safe distance away.

8.7 Gasoline-powered equipment such as cut-of-saws shall not be refueled in a trench. To prevent the accumulation of flammable vapors in a trench, refueling operations shall take place away from the trench.

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- 8.8** The exhaust of fuel-powered equipment such as dewatering pumps and generators shall be positioned away from the trench to prevent the accumulation of hazardous gases and vapors in the trench.
- 8.9** When the depth of a trench exceeds 6 feet, the use of fuel-powered soil compactors is prohibited. Compaction shall be achieved through the use of excavator attachments or remote control compaction equipment.
- 8.10** Smoking is not permitted in excavations and trenches.

**9.0 HAZARDOUS ATMOSPHERES**

- 9.1** In any excavation greater than 4 feet in depth or where hazardous conditions could be reasonably expected (e.g., near landfills), atmospheric testing must take place. These excavations are to be treated as if they were confined spaces. Use testing equipment to make sure the oxygen content, toxicity, and lower explosive limits (LELs) of flammable vapors and gases are at acceptable levels prior to entry. (See Confined-Space Entry Procedures for more information.)
- 9.2** An excavation shall not be entered if
- Oxygen content is less than 19.5%.
  - Flammable vapors and gases exceed 10% of the LELs.
  - Toxic vapors and gases exceed site-specific action levels.
- 9.3** If the atmosphere in an excavation is discovered to be hazardous, entrance shall not be made until the excavation can be properly ventilated or respiratory protection is provided.
- 9.4** Emergency rescue equipment such as a self-contained breathing apparatus (SCBA), a safety harness, retrieval system, or a basket stretcher shall be readily accessible where hazardous atmospheric conditions exist or are expected to develop during work in an excavation. The equipment shall always be accompanied by an attendant when in use.
- 9.5** When forced-air ventilation is used to reduce the levels of airborne hazards to acceptable levels, atmospheric monitoring shall be conducted on a continuous basis.

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**10.0 WATER ACCUMULATION**

- 10.1** Diversion ditches, dikes, or other suitable means shall be constructed to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation.
- 10.2** Personnel shall not work in an excavation where water has accumulated or is accumulating unless adequate protection has been provided. When dewatering equipment is used to control or prevent water from accumulating, a competent person shall monitor the operation.
- 10.3** After each rainstorm or freeze/thaw cycle, the integrity of the excavation shall be determined.

**11.0 UNDERGROUND UTILITIES**

- 11.1** Existing utilities shall be located before excavating. The utility companies shall be contacted to obtain locates. The accuracy of locates should be considered to be 2 feet on either side of the marked underground facility unless locate instructions specifically indicate other margins of error for the boundary lines.
- 11.2** Excavation equipment shall not be used within the margin of error of the utility's boundary lines until an additional locate is obtained. The utility company must be recontacted to obtain the second locate.
- 11.3** Mechanical excavation equipment should not be used within the boundary limits of the locate until the exact location of the utility has been determined. Use the potholing procedures below or other methods to determine the exact centerline and elevation of the utility. (Note: The potholing procedure should be done in accordance with the utility company's procedures or under the supervision of a representative of the utility company.)
- (a) Machine-excavate immediately outside the boundary limits and then hand digging laterally until the utility is exposed.
  - (b) (i) Hand excavate perpendicularly to the centerline of the utility in cuts of no more than 1 foot.
  - (ii) Mechanical equipment can then be used cautiously to widen the hand-dug trench to the depth of the hand-dug excavation.
  - (iii) Repeat steps ii and iii until the utility is located.

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- 11.4 Soil around and between old excavations such as utility trenches will be classified as type C soils (poor soils that are likely to cave in).
- 11.5 While an excavation that exposes underground utilities is open, the underground utilities shall be protected, supported, or removed as necessary to safeguard employees.
- 11.6 Contact with or damage to utilities during excavation shall be immediately reported to the utility company. The excavation shall not be backfilled until the utility company representative has evaluated and repaired the damage.

**12.0 COMPETENT PERSON**

- 12.1 All excavation activities shall be completed under the direct supervision of a competent person. The competent person shall conduct daily inspections of the excavation, the adjacent area, and the protective systems for evidence of situations that may result in cave-ins and indications of failure of protective systems, hazardous atmospheres, and other hazardous conditions. In accordance with 29 CFR 1926.652, the competent person shall conduct manual soil tests to classify the soil type.
- 12.2 When the competent person finds evidence of a situation that may result in a cave-in or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure worker safety.
- 12.3 All supervisory personnel who fail to comply with the directives of the competent person will be subject to disciplinary action.
- 12.4 An inspection shall be conducted by the competent person prior to the start of work and as needed throughout shifts during which employee exposure can be anticipated.

**13.0 PRECAUTIONS TO BE TAKEN FOR WORKING AROUND EXCAVATIONS**

- 13.1 All employees working in or near an excavation are required to wear a hardhat, safety glasses and a high-visibility traffic vest. Additionally, rubber boots are required when employees are working in mud or water.
- 13.2 Excavations shall be backfilled as soon as possible upon completion of work. Where excavations cannot be backfilled immediately, they shall be barricaded and guarded to prevent unauthorized entrance.
- 13.3 No employee shall be permitted to be underneath the loads in lifting or digging equipment. Employees shall be required to stand away from vehicles being loaded or

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unloaded to avoid being struck by any spillage or falling material. Employees shall remain in clear view of the operator at all times.

- 13.4** Employees shall not cross behind an operating excavator or work or walk within the swing radius of an excavator. Workers shall always stay to the cab side of an excavator or other construction equipment and maintain visual contact with the operator. Where practical, the swing radius of the excavator shall be barricaded.
- 13.5** When equipment is operated adjacent to an excavation or when equipment is required to approach the edge of an excavation, a warning system such as a signaller, barricades, mechanical signals, or stop logs shall be used.
- 13.6** A spotter shall be posted when excavations of depths of 5 feet or greater are being dug and when workers are in the excavation. The spotter shall be located on the cab side of the excavator and shall remain in visual or audio contact with the operator and workers in the excavation.
- 13.7** Workers shall visually inspect all side walls of an excavation for signs of soil cracks, water seepage, ledges and wedges, soft pockets (clay over sand or gravel), loose material, and evidence of prior collapse. Personnel shall not enter an excavation when these indicators of sidewall stress are present. Entrance into an excavation shall be made only when the sidewalls have been stabilized or the hazard has been eliminated.
- 13.8** All workers shall visually inspect the protective system for damage, missing or defective parts, and leakage of hydraulic fluid.
- 13.9** Workers shall maintain a 2-foot distance from the edge of any excavation. Objects shall not be thrown into or out of an excavation.
- 13.10** Smoking shall not be permitted around an excavation.

**14.0 EMPLOYEE RIGHTS**

MWHC employees have the right to refuse to enter an excavation that does not meet the requirements of this procedure. Supervisors and management personnel will be held accountable for knowingly creating an excavation hazard.

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**1.0 OBJECTIVE**

The objective of this procedure is the prevention of incidents related to the use of hand tools used by MWH Constructors, Inc. (MWHC) personnel.

**2.0 PURPOSE**

This procedure establishes guidelines for the safe use and maintenance of hand tools used on all projects.

**3.0 CARE OF HAND TOOLS**

- 3.1** All hand tools shall be maintained in a safe working condition and shall be inspected prior to use. Defective hand tools shall not be used and shall be tagged "OUT OF SERVICE" until repairs can be made.
- 3.2** When not in use, hand tools shall be stored in suitable boxes or containers or shall be hung on racks. Tools shall not be left in walkways or other places where there is a chance that the tool will fall or create a tripping hazard. Cutting edges shall be protected and tools shall not be left where they will roll off benches or tables. Storage areas shall be kept free from moisture to prevent corrosion.
- 3.3** Damaged or worn hand tools shall be promptly and properly repaired. Temporary and makeshift repairs are prohibited. If tools cannot be repaired on the job, they shall be sent to the factory or a shop for repairs. Tools that cannot be repaired shall be discarded.
- 3.4** Hand tools shall be protected against corrosion damage. Accumulated grease, dirt, sawdust, and moisture shall be promptly removed, and power tools shall be cleaned thoroughly when necessary with a nonflammable, nonirritating solvent and wiped clean. Moving and adjustable parts shall be lubricated as necessary.
- 3.5** Hand tools must be kept sharp to improve accuracy and safety. Oilstones or grindstones shall be used for sharpening tools. If an abrasive wheel must be used for sharpening tools, workers shall grind only a small amount at a time with the tool rest not more than one-eighth of an inch from the surface of the wheel. Workers shall dip the tool frequently in water to keep it cool.

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**4.0 SAFE USE OF HAND TOOLS**

- 4.1** Employees who use hand tools shall be provided with and required to wear personal protective equipment (PPE), such as gloves, eye protection, to protect them from the hazards involved. Employees shall be given instruction or training in the proper use of hand tools.
- 4.2** Hand tools shall be selected based on their weight and size and the type of tool needed for the job. Hand tools shall not be used for anything other than their intended purpose and shall not be altered or modified.
- 4.3** All handles must be tightly fitted. Workers shall check wood handles carefully and tighten them with wedges when necessary. Workers shall also inspect handles for splitting and cracking.
- 4.4** Workers shall exercise extreme caution when working around electrical circuits, and shall use insulated and nonconducting tools inspected periodically by a qualified technician.
- 4.5** Workers shall use nonsparking tools in the presence of flammable materials, explosive dusts, and vapors.

**5.0 SPECIFIC HAND TOOLS****5.1 UTILITY KNIVES**

The following safety precautions for utility knives shall be observed:

- Use only utility knives with retractable blades.
- Always cut away from the body, especially away from the hands.
- Retract the blade immediately when the work is finished.
- Do not carry a utility knife in garment pockets; carry it in a sheath.

**5.2 WRENCHES**

The following safety precautions for wrenches shall be observed:

- Select the correct size and type of wrench for each job.
- Do not extend the wrench handle with a pipe or cheater bar.
- Never use a hammer to strike a wrench handle unless the wrench is equipped with a striking face.

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- Keep jaw corrugations on wrenches sharp and clean, and keep handles and adjusting screws in good condition.
- Never use conventional sockets with air impact wrenches.

### **5.3 CHISELS AND BULL POINTS**

The following safety precautions for chisels and bull points shall be observed:

- Select the proper chisel for the material being cut; the chisel shall be large enough for the job at hand and shall be driven with a hammer of sufficient weight.
- Hold the chisel with a steady but relaxed grip or use a chisel holder. Use tongs when holding a chisel being struck by another person.
- Keep your eyes on the cutting edge of the chisel
- Wear eye protection when chiseling.
- Chisels shall be kept free of mushroomed heads, and the cutting edge shall be kept sharp. Maintain original shape and angle of cutting edge when sharpening chisels.

### **5.4 SCREWDRIVERS**

The following safety precautions for screwdrivers shall be observed:

- Select the proper screwdriver to fit the size of screw.
- Do not use screwdrivers as chisels, pry bars, or for anything other than its intended purpose.
- Do not grind a screwdriver to a fine point to fit all screw heads.
- Keep the tip properly ground and squared across
- The handle must fit the shank tightly.

### **5.5 HAND SAWS**

The following safety precautions for hand saws shall be observed:

- Select a saw of the proper shape and size with the correct teeth for the size cut to be made and the material to be cut.

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- Keep the teeth and blade properly set. Protect the teeth from damage when not in use.
- Hold the saw firmly and start the cut slowly to prevent the blade from jumping.
- Check the material being cut for nails, knots, or other objects that may damage the saw or cause it to buckle.
- Hold the pieces being cut firmly in place. If long pieces are being cut, use a helper or supporting bench to prevent pinching of the saw at the cut.

**5.6 HAMMERS**

The following safety precautions for hammers shall be observed:

- Select the proper size and weight hammer for the job.
- Strike the surface being hit squarely to decrease the chance of hitting a glancing blow.
- Do not strike one hammer against another.
- Control the hammer by holding it at the end of the handle, which will increase the force of the blow.
- Wear eye protection when you are striking objects such as chisels and punches.
- Use a ballpeen hammer or mallet to strike chisels and punches. Do not use a claw hammer for this task.
- Check wooden handles for a tight fit and for splitting and cracking. Do not use a hammer with a loose or worn head.
- Never drive a screw with a hammer.

**5.7 PLIERS**

The following safety precautions for pliers shall be observed:

- Use pliers only when no other tool will do the job.
- Never use pliers as wrenches or nail pullers.
- Use insulated pliers for all electrical work.
- Use cutting pliers for cutting soft metals only, never hard metals.
- When cutting metal or plastic straps, secure the ends, because the straps are under tension and can fly back and hit you.
- When pulling with pliers, pull down and away so as to not hit yourself in the face.

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**5.8 SHOVELS**

The following safety precautions for shovels shall be observed:

- Select the proper size and shape shovel for the job.
- Check shovel handles for cracks, splits, and splinters before using it.
- Check shovel blade to verify it is sharp and free from jagged and split edges before using it.

**5.9 PICKS**

The following safety precautions for picks shall be observed:

- Make sure that pick handles are free of splinters, splits, and cracks and that the head is firmly affixed to the handle before using it.
- Check areas behind and around you for clearance before swinging.

**5.10 HATCHETS, AXES, AND ADZES**

The following safety precautions for hatchets, axes, and adzes must be observed:

- Prevent hatchets and axes from rebounding toward other workers.
- When trimming a tree on the ground, keep the trunk between the swing of the tool and your feet and legs. Clear sufficient space for the swing.
- When using an adze, spread your legs and keep the object to be trimmed between your knees.

**5.11 HAND TRUCKS AND WHEELBARROWS**

The following safety precautions for hand trucks and wheelbarrows shall be observed:

- Select proper hand trucks and wheelbarrows for the job.
- Make sure the frames are strong enough and straight. Hand protection or handle guards shall be used. The wheels should be strong and well secured to the frame.
- Exercise extreme care around ramps and walkways. Carefully plan wheelbarrow traffic to avoid accidents.
- Do not try to catch or support a wheelbarrow that is tipping. To avoid injury, let it tip.
- If hand trucks or wheelbarrows are to be used on ramps and decks, those ramps and decks must be strong enough to support the weight being carried by the hand truck or wheelbarrow.

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**5.12 JACKS**

The following safety precautions for jacks shall be observed:

- Select jacks strong enough to raise and hold the load.
- The rate load capacity of the jack must be legibly and permanently marked on the jack.
- Swivel heads and caps must be in good condition and function properly before using the jack.
- Position the jack on a firm, level foundation. Be sure the jack cannot tip and is in line with the vertical movement of the load.
- After raising a load, securely block it before removing the jack. Crib any load that must remain in a raised position for any length of time. Such loads should be cribbed or blocked, or both, before personnel can work under the load.
- Clean and lubricate jacks regularly and protect them from moisture and damage.
- Inspect jacks thoroughly before use. Do not use defective jacks, and tag defective jacks as “Out of Service.”
- Only qualified service technicians shall make repairs to damaged jacks.

**6.0 CARRYING TOOLS**

- 6.1** Workers shall never carry pointed tools such as screwdrivers and chisels point up in any pocket, nor shall workers carry them point down in front pockets. Tools shall be hand carried with the point or sharp edge held away from the body or carried in a toolbox, tool pouch, or special tool belt.
- 6.2** Workers must not carry tools in a way that interferes with their ability to use both hands if they are climbing a ladder. Tools should be raised or lowered by rope (or in a bucket if necessary).
- 6.3** Tool belts shall be equipped with suspenders to support the weight of the belt. If the tool belt is excessively heavy, some tools must be removed to lighten the load.

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**1.0 OBJECTIVE**

The MWH Constructors, Inc. (MWHC) Hearing Conservation Program has been established to prevent the harmful effects of noise and to protect employees from hearing loss.

**2.0 PURPOSE**

The MWHC Hearing Conservation Program reflects the requirements of 29 CFR 1910.95 for the protection of employees from the harmful effects of noise. The elements of this program shall be implemented when employees' exposure to noise equals or exceeds an 8-hour time-weighted average sound level of 85 decibels (dBA) measured on the A-scale (slow response) or, equivalently, a noise dose of 50 percent. For the purpose of this program, an 8-hour time-weighted average of 85 decibels will be referred to as the action level.

**3.0 AUDIOMETRIC TESTING**

- 3.1** As part of the MWHC Medical Monitoring Program, audiometric testing will be performed on employees at risk of being exposed to noise at or above the action level.
- 3.2** A baseline audiometric test and annual audiometric testing shall be provided to those employees who do not participate in the Medical Monitoring Program but are exposed to noise at or above the action level.
- 3.3** Audiometric testing, instrumentation, and evaluation shall meet the minimum requirements as set forth in 29 CFR 1910.95, Subpart G and Appendices B through D.

**4.0 NOISE MONITORING**

- 4.1** The Health and Safety Supervisor shall conduct a sound level survey to determine workplace noise levels and employee exposure to noise.
- 4.2** Area noise monitoring shall be conducted using a sound level survey meter (Type II set on slow response, A weighted scale) to identify areas in which noise is at or above the action level.
- 4.3** Personal noise monitoring with a noise dosimeter shall be conducted to determine employees' actual exposure to noise as measured over an 8-hour period.
- 4.4** Noise monitoring instrumentation shall be calibrated before and after each use according to the manufacturer's instructions. The Health and Safety Supervisor shall maintain a written record of the calibration results.

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- 4.5 Employees or their designated representative shall have the right to observe all noise monitoring activities.
- 4.6 Results of all area noise monitoring shall be made available to all employees within 21 days after the monitoring event, regardless of the exposure level.
- 4.7 Results of personal monitoring shall be made available to the employee or his or her designated representative within 21 days after the monitoring event, regardless of exposure levels. The Health and Safety Supervisor is responsible for notifying the employee or his or her designated representative in writing of the monitoring results.
- 4.8 The Health and Safety Supervisor shall maintain all monitoring results for the duration of the project. Upon completion of the project, the results shall be forwarded to the Health and Safety Director.
- 4.9 The following factors will be used to determine when noise monitoring is to be initiated:
- Complaints about the volume of noise
  - Noisy conditions that make normal conversation difficult
  - The belief of employees or supervisory personnel that an assigned task will be in a noisy or potentially noisy environment
  - Indications of employee hearing loss
  - A request by the client or contract obligations
- 4.10 Monitoring shall be repeated whenever a change in production, process, equipment, or controls has the potential to increase noise exposure to the extent that employees may be exposed to noise at or above the action level.

**5.0 ACTIONS TO BE TAKEN BASED ON NOISE MONITORING**

When noise monitoring indicates that noise levels are at or above the action level, the following actions shall be taken:

- The employees shall be notified of the location of the noise areas and the methods to be used to reduce personal noise exposure. The training elements of this program shall be implemented.
- Employees shall be provided with, and shall use, hearing protection devices regardless of the duration of exposure.
- The area or machine shall be posted with appropriate signs to warn the employees that

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hearing damage may result from working in the area or at the machine and that hearing protection is required.

- Where practical and feasible, engineering controls shall be implemented to reduce the noise level.
- Audiometric testing shall be conducted on employees who have no baseline audiogram.
- Personal and area noise monitoring shall be conducted in the high-risk noise area to determine the noise dose and the effectiveness of hearing protection devices to attenuate the noise.
- A copy of 29 CFR 1910.95, Occupational Noise Exposure, shall be posted in the workplace.

**6.0 HEARING PROTECTION DEVICES**

- 6.1** When exposed to noise at or above the action level, employees shall be provided with, and shall use, hearing protection devices regardless of the duration of exposure.
- 6.2** Employees will be trained in the use and care of the hearing protection devices required to be worn.
- 6.3** Supervisory personnel are responsible for monitoring the use of hearing protection devices.
- 6.4** Hearing protection devices shall have a minimum noise reduction rating of 29 decibels.
- 6.5** Various types and sizes of hearing protection devices shall be available to ensure proper fit. Employees who cannot wear the prescribed hearing protection devices will be fitted for a custom-molded hearing protection device.
- 6.6** As part of the noise-monitoring program, the Health and Safety Supervisor shall conduct an evaluation of the hearing protection device's ability to attenuate noise. The evaluation shall be conducted in accordance with Appendix B of 29 CFR 1910.95.

**7.0 TRAINING**

When noise is at or above the action level, employees shall receive training in hearing conservation.

The training shall include, but not be limited to, education in the following areas:

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- Review of the Hearing Conservation Program and OSHA Standard 29 CFR 1910.95
- The purpose of the audiogram and an explanation of the testing procedure
- The physiology of hearing
- Types of hearing loss: Presbycusis, temporary threshold shift, permanent threshold shift
- The physics of sound
- Recognition of environmental noise
- Noise on the job and the locations of noise areas
- Noise monitoring methods and procedures
- Engineering and administrative controls
- The use, limitations, and care of hearing protective devices
- Selection and fit-testing of hearing protective devices

**8.0 ENGINEERING CONTROLS**

- 8.1** In the selection of equipment, consideration shall be given to the noise the equipment will generate. The manufacturer's literature must be reviewed. If optional noise control devices are offered for the equipment, the cost of such control devices should be figured into the purchase price.
- 8.2** In the design and layout phase of a project, consideration shall be given to community noise level requirements as measured at the property line.
- 8.3** When practical and feasible, engineering controls shall be implemented to control noise at the source.
- 8.4** When engineering controls have been provided for the control of noise, they shall be used and maintained.

**9.0 ADMINISTRATIVE CONTROLS**

- 9.1** Administrative controls, such as limiting the time an employee spends in a noisy environment, will be reserved for uncontrollable noise sources that exceed 100 dBA or when hearing protection fails to attenuate the noise. Even if the time an employee will spend in a noisy environment is limited, hearing protection shall be used.
- 9.2** Employees shall not be exposed to noise in excess of 105 dBA regardless of exposure duration unless hearing protection devices are used.

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**10.0 GENERAL RULES FOR HEARING CONSERVATION**

- 10.1** Individuals undergoing audiometric testing shall avoid high levels of occupational and nonoccupational noise exposure during the 14 hours preceding audiometric testing.
- 10.2** Employees shall wear the appropriate hearing protective devices as required to attenuate noise.
- 10.3** Employees must not chew gum or tobacco while wearing hearing protective devices.
- 10.4** Hearing protective devices, whether disposable or reusable, must not be shared.
- 10.5** Engineering controls shall not be altered or modified without prior approval.
- 10.6** Employees shall notify the Health and Safety Supervisor when they experience signs or symptoms of noise exposure.
- 10.7** Cotton shall never be used as a hearing protective device.

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**1.0 OBJECTIVE**

The objective of this procedure is to prevent incidents involving heavy construction equipment used for earthmoving, demolition, and land clearing.

**2.0 PURPOSE**

This procedure establishes criteria for the prevention of incidents when employees are working around or operating heavy construction equipment.

**3.0 APPLICATION**

This procedure covers the use of earthmoving, demolition, and land-clearing equipment such as bulldozers, scrapers, off-road dump trucks, excavators, front-end loaders, skid-steer loaders, rollers, compactors, motor graders, and any other self-propelled construction equipment.

**4.0 JOB SITE SETUP**

- 4.1** Heavy equipment selection shall be based on the size of the work site, the terrain, and weather conditions, and on the scope of work to be performed.
- 4.2** A heavy equipment staging area shall be provided for the safe entry of the equipment and as a place to carry out routine maintenance and servicing. The staging area shall be located away from overhead utilities, pedestrian traffic, and vehicle parking areas. The staging area shall be on level ground that must be capable of supporting the impact imposed by heavy equipment.
- 4.3** The general work area shall be arranged to minimize the backing up of heavy equipment.
- 4.4** Access and haul roads shall be designed, constructed, and maintained to safely accommodate the movement of the vehicles and equipment involved. Haul roads shall be constructed to widths suitable for safe operation of the equipment at the travel speed necessary. The maximum allowable grade shall be limited to 10%.

The design of access and haul roads shall be in writing and shall address the following:

- Equipment usage, traffic density, and hours of operation
- Road layout and widths, horizontal and vertical curve data, and sight distances
- Sign and signalperson requirements, road marking, and traffic control devices

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- Drainage control
- Points of contact between vehicles and the public, and safety controls at these point of contacts
- Maintenance requirements, including roadway hardness and smoothness and dust control

**5.0 EQUIPMENT SAFETY FEATURES**

**5.1** All self-propelled construction equipment shall be equipped with the following safety features:

- Rollover protective structures (ROPS) meeting Society of Automotive Engineers (SAE) requirements
- Seatbelts
- Multipurpose dry chemical fire extinguisher rated not less than 2A:10B:C
- Multidirectional alarm
- Operator's manual
- Horn
- Lights
- Other warning devices

**5.2** In addition to the above safety features, equipment used for demolition and land clearing shall be equipped with falling object protective structures (FOPS) meeting SAE requirements. Land-clearing equipment must be equipped with a canopy structure made from ¼-inch woven wire mesh with no openings greater 1 inch.

**5.3** All equipment attachments shall be approved by the manufacture whose equipment the attachment will be use on.

**6.0 MOBILIZATION/DEMOBILIZATION**

**6.1** Before heavy equipment is transported on a flatbed trailer, a specific route shall be planned. Clearances of bridges, railroad crossings, and other obstacles should be checked, and adequate allowances made for overhang booms. Congested areas should be avoided. Oversized loads must conform to state standards, which usually require special permits.

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- 6.2** The worker who drives the equipment onto the truck or trailer shall be thoroughly familiar with the equipment. The ramp and truck or tractor-trailer must be adequate to carry the load. Side loading of equipment onto a trailer is strictly prohibited.
- 6.3** Chock blocks must be placed in front of the truck's wheels so that it cannot move during loading. Both the bed of the truck or trailer and the wheels or tracks of the equipment shall be cleaned of all clay, soil, oil, and grease, which might cause the equipment or worker to slip.
- 6.4** Workers other than the operator driving the equipment on or off the truck or trailer shall stay a safe distance away from the loading and unloading operations.
- 6.5** The operator's manual shall be consulted to determine the direction in which the machine is mostly safely loaded onto the truck or trailer.
- 6.6** When the equipment is properly situated on the trailer, the following measures shall be taken to secure the equipment:
- Lower buckets, blades, and booms to the trailer bed.
  - Shift into park or low gear. Set the parking brake.
  - Turn off the engine and remove the key.
  - Secure the equipment to truck or trailer with rated chains and tighten with ratchet binders. Tie-down points recommended by the manufacturer shall be used. "Cheaters" on ratchet binders shall not be used under any circumstances.
  - Carefully tighten chains so that they are not in contact with hoses, hydraulic cylinders, rods, or tires.
- 6.7** Equipment shall never be transported, even over short distances, unless it is properly secured.

**7.0 INSPECTION PROCEDURES**

- 7.1** Equipment shall be inspected at the following times:
- Delivery
  - Post-assembly
  - Before each shift (walk-around, pre-ignition, and post-ignition checks)

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- 7.2 A qualified mechanic or an operator who is knowledgeable about the equipment shall inspect the equipment to make sure that it is in safe operating condition. Inspections and tests will be conducted in accordance with the manufacturer's recommendations, and a written record of the inspections shall be kept on the equipment or in a project file. A Daily Heavy Equipment Inspection Report is provided as Attachment A to this procedure.
- 7.3 When deficiencies that affect the operation of equipment are found, the equipment will be immediately taken out of service until unsafe conditions are corrected. A "DO NOT OPERATE" tag indicating that the equipment is not to be operated will be placed on the operator controls of the equipment. When required or necessary, lockout procedures will be used. When corrections are made, the equipment will be re-tested for safe use before being returned to service.
- 7.4 Consideration shall be given to the following items in the performance of equipment inspections.
- Missing nuts, bolts, pins, loose fittings and couplings, cracked paint, frayed cables and hoses, evidence of fluid leakage on equipment or ground, and loose tracks and pads.
  - Fluid levels in the battery, hydraulic system, brake system, and cooling systems; engine lubrication; and fuel supply. CAUTION: Never use your hands to check for hydraulic leaks. An open flame shall not be used to check fluid levels or look for leaks.
  - Condition of glass in cab-clean and not broken, gauges checked for proper function, and reading, test of brakes lights, horn, backup alarm, steering and other controls

**8.0 RESPONSIBILITIES****8.1 Supervisory Personnel**

Supervisory personnel and the health and safety supervisor have the following responsibilities:

- Implemented and enforced the provisions of this program.

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- Verifying that equipment operators are competent and qualified to operate equipment in a safe and efficient manner
- Providing instruction to operators and ground laborers to prevent the occurrence of heavy equipment incidents.

**8.2 Equipment Operators**

The equipment operator shall be responsible for the safe operation of the equipment. The operator must know how many ground personnel are working in the vicinity of the equipment and their locations. The operator shall be familiar with the blind spots on the equipment and shall avoid making turns in the direction of the blind spots. In addition, the equipment operators shall

- Read and heed directions and instructions in the operator's manual.
- Know the access and haul road routes and obey posted speed limits and directional signs.
- Yield the right of way to ground personnel, motor vehicles, and emergency vehicles.
- Be responsible for the daily inspection of their machines.
- Not leave equipment unattended unless the engine has been shut down and the parking procedures followed (see paragraph 10.4).
- Use seatbelts and other safety devices. Safety devices shall not be bypassed or modified.
- Always look in the direction of travel.
- Wear a hardhat and traffic safety vest when working outside the equipment.
- Start and operate the equipment controls only from the operator's compartment.
- Not permit any rides on or in the equipment or lift workers with a boom, bucket, or other non-approved attachment. Rides are permitted only in the cab and only if the cab has a passenger's seat.
- Maintain 3 points of contact with the steps and handholds when mounting and dismounting the equipment. Never use the steering wheel or controls as handholds.
- Not wear personal stereo headsets when operating equipment.
- Secure in the cab personal belongings such as lunchboxes and water jugs. The operator may keep a few personal effects in the cab, but it is hazardous to the operator's safety to have too many items stored in the cab.

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- Stop the equipment when they cannot see ground personal such as grade checkers, laborers, and signalpersons working in the area.
- Keep body parts out of rotating parts, power take offs, (PTOs) and pinch points.

**8.3 Ground Labor**

The responsibilities of ground labor when they are working around heavy equipment are as follows:

- Know the location of the equipment's blind spots and stay out of them. (On excavators and scrapers, the blind spot is to the operator's right.)
- Maintain visual contact with the operator at all times. (As a rule of thumb, if you cannot see the operator, the operator cannot see you.)
- Not use personal stereo headsets when working around heavy equipment.
- Wear hardhats, eye protection, and traffic safety vests when working around equipment.
- Not store tools, personal clothing, water jugs, or lunchboxes on or in heavy operating equipment.
- Not ride in or on buckets, booms, other non-approved attachments, or fenders, or in the cab of operating equipment unless the cab is equipped with a passenger seat.
- Stay clear of pinch points and the boom swing radius of excavating machines.
- Not work under suspended loads.

**9.0 MAINTENANCE AND REPAIRS**

- 9.1** Equipment is to be shut down before fueling and while repairs or manual lubrications are performed except when equipment is designed to be running during service.
- 9.2** Maintenance will be performed in a location that protects the worker from traffic, site activities, and area hazards.
- 9.3** Before repairs are made on heavy equipment, the mechanic shall make certain that the equipment is shut down and secured so that any system that could create a hazard cannot be activated without the approval of the mechanic. A "DO NOT OPERATE" tag shall be placed on the controls or the controls shall be locked out.

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- 9.4** Parts that are suspended or held apart by slings, hoists, hydraulics, or jacks must also be blocked, fully lowered, or cribbed before personnel are permitted to work underneath or between them.
- 9.5** When maintenance activities involve scraper bowls, bulldozer blades, buckets, dump bodies, or any other such component, the pinch point shall be blocked or secured to prevent unintentional movement. The blocks or equivalent retaining device must be able to support the weight of components.
- 9.6** During the charging or jumpstarting of a battery, cell caps shall be removed and the opening covered with a damp rag. The jumper cables shall be connected in the following sequence:
1. The positive cable is attached to the positive terminal of the dead battery.
  2. The other clamp of the positive cable is attached to the positive terminal of the good battery.
  3. The negative cable is attached to the negative terminal of the dead battery.
  4. The other clamp of the negative cable is attached to the engine block or the frame of the vehicle with the good battery.

To prevent explosions, flashlights should be used to check electrolyte levels. Workers must attach the cables firmly so that sparking does not occur. Workers charging or jumpstarting a battery shall wear eye and face protection and shall stand clear of the battery.

- 9.7** To check the pressure of tires or to inflate them, a clip-on chuck equipped with an inline valve with a gauge or pressure regulator preset to the desired pressure shall be used. The chuck shall have a hose long enough to permit the worker to stand clear while the tire is being checked or inflated.
- 9.8** A trained tire mechanic shall perform the servicing of multi-piece rim wheels in accordance with 29 CFR 1910.177. A safety tire rack, cage, or equivalent protection shall be provided and used when the mechanic is inflating, mounting, or dismounting tires installed on split rims or rims equipped with locking rings or similar devices.
- 9.9** Guarding systems must be in place when there is the possibility that people will come in contact with hot surfaces, belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or reciprocating, rotating, or moving parts.
- 9.10** Any modification or addition that affects the capacity or safe operation of machinery or equipment must not be made without prior written approval from the manufacturer. If such modifications are made, the capacity, operation, safety, and maintenance

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instruction plates, tags, or decals will be changed accordingly. The original safety factor of the equipment must not be reduced.

**10.0 BASIC OPERATING RULES**

- 10.1** Only trained and experienced personnel who are familiar with the use, limitations, and maintenance requirements of the equipment are permitted to operate heavy equipment. Equipment must be operated in accordance with the manufacturer's instructions and recommendations. Operators shall wear seatbelts when operating equipment.
- 10.2** Equipment must not be operated in a manner that will endanger persons or property, nor are safe operating speeds or equipment load ratings to be exceeded. Before moving equipment, operators shall make certain that no workers who are around the equipment are in danger.
- 10.3** Operators shall be given the opportunity to practice operating their assigned equipment while wearing special personal protective equipment (such as respirators or Tyvek) before entering exclusion zones or areas where other workers are present.
- 10.4** When parking a machine, the operator shall engage the locking mechanism, lower the blade, bucket, or other attachments to the ground or to a secured position, place the shift lever in park or low gear, and shut the engine down. All equipment must be parked on level ground or, if not on level ground, secured with chocks or equivalent devices. When possible, heavy equipment shall be parked in locations inaccessible to children and unauthorized persons.
- 10.5** All equipment left unattended at night shall be equipped with lights, reflectors, or barricades if it is parked adjacent to a highway that is in normal use or adjacent to construction areas where work is in progress.
- 10.6** Towing heavy equipment presents an added hazard in that someone could get crushed between the towing vehicle and the equipment being towed. The towing vehicle shall be stopped, the shift levers placed in neutral, and the brakes set before workers are permitted to couple the towed equipment. Wheels of equipment being coupled should be chocked. Operators must also pay attention to the pinching hazards associated with coupling and uncoupling the towing equipment.
- 10.7** When heavy equipment is operated or moved on public roadways, a "slow moving vehicle" emblem will be affixed to the back of the equipment.
- 10.8** During travel, buckets, blades, and other attachments shall be kept close to the ground.

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**10.9** The machine's transmission shall always be kept in gear during travel.

**10.10** Safe distances shall be maintained between heavy equipment and overhead power lines and utility poles. The minimum safe clearance distance is 10 feet. The utility company shall be notified and consulted to determine the actual safe clearance distance. Dump bodies and attachments shall be lowered before passing under overhead power lines. When power lines cross access or haul roads, signs shall be posted on each side of the crossing approach indicating the presence of the power lines. On heavily traveled routes, rider poles or "goalposts" shall be located on each side of the crossing approach to ensure that booms, masts, dump bodies, and other such attachments are lowered to a safe position.

**10.11** Construction equipment or vehicles shall not be moved onto grades with angles that will cause the equipment to tip or roll over. Operators must know the limits of each machine they operate. Guidelines for preventing roll over are as follows:

- Avoid steep slopes or unstable surfaces. If you must drive on a slope, keep the load low and proceed with caution. Do *not* drive *across* a steep slope. Drive straight up and down the slope. (If you must turn on an incline, turn wide and slow with the bucket carried low.)
- Travel up and down slopes with the heavy end of the loader pointed uphill.
- Do not dig under the machine or stabilizers. Avoid undercutting and working close to edges of excavations. Never undercut a high bank, because the edges could collapse.

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**DAILY HEAVY EQUIPMENT INSPECTION REPORT**

Equipment Number \_\_\_\_\_ Date \_\_\_\_\_ Last Date Inspected \_\_\_\_\_

Make/Model \_\_\_\_\_

*“G” New or in good condition      “F” Fair or in Serviceable Condition      “M” Missing*  
*“R” Requires Maintenance or Repairs      “N/A” Not Applicable*

**1. GENERAL**

- |  |  |
|--|--|
| <input type="checkbox"/> Parking Brake System  | <input type="checkbox"/> Load capacities, operating speeds, hazard warnings posted |
| <input type="checkbox"/> Headlights, taillights, brake lights, warning signals, etc. | <input type="checkbox"/> Seatbelts   |
| <input type="checkbox"/> Horn  | <input type="checkbox"/> Rollover protective structure (ROPS)                      |
| <input type="checkbox"/> Backup alarm  | <input type="checkbox"/> Falling object protective structure (FOPS)                |
| <input type="checkbox"/> Windows   | <input type="checkbox"/> Tire pressure   |
| <input type="checkbox"/> Windows safety glass?                                       | <input type="checkbox"/> Fenders over tires  |
| <input type="checkbox"/> Anti-fogging device   | <input type="checkbox"/> Oil level   |
| <input type="checkbox"/> Windshield wipers   | <input type="checkbox"/> Hydraulic fluid   |
| <input type="checkbox"/> Operator controls tested and working                        | <input type="checkbox"/> Hydraulic lines and operating cables                      |
| <input type="checkbox"/> Gauges working  | <input type="checkbox"/> Brake fluids  |
| <input type="checkbox"/> Fire extinguisher   | <input type="checkbox"/> Other fluids  |
| <input type="checkbox"/> Other safety equipment or devices                           | <input type="checkbox"/> Drives  |
| <input type="checkbox"/> Engine  | <input type="checkbox"/> Bladeholders  |
| <input type="checkbox"/> Motor   | <input type="checkbox"/> Tracks  |
| <input type="checkbox"/> Chassis   | <input type="checkbox"/> Wheel mount bolts   |
| <input type="checkbox"/> Engine mount bolts  |  |

**2. SUMMARY STATUS**

Is the equipment in safe operating condition?  Yes  No

Specify maintenance or repair schedule for items noted in Section 1. above: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**3. REMARKS:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Inspection by (Competent Person): \_\_\_\_\_ Date: \_\_\_\_\_

**MWHC HEALTH AND SAFETY PROCEDURES**Revision: 1  
Issued: 04/04**09.06 HOUSEKEEPING AND SANITATION**

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**1.0 OBJECTIVE**

All MWH Constructors, Inc. (MWHC) jobsites shall adhere to a strict level of cleanliness to prevent incidents related to poor housekeeping and sanitation.

**2.0 PURPOSE**

This procedure establishes guidelines for housekeeping and sanitation that shall be used on all MWHC projects.

**3.0 GENERAL REQUIREMENTS FOR HOUSEKEEPING**

- 3.1** Scrap materials and rubbish are fire and accident hazards and shall not be allowed to accumulate on the jobsite. Proper receptacles and storage areas shall be provided and used. Covered trash containers shall be provided for the storage and disposal of trash, paper, food wrappers, etc.
- 3.2** Tools and materials should be neatly stored when not in use and should not be left where they may create a hazard to other employees.
- 3.3** Toilets, wash-up areas, shower trailers, and lunchrooms and break areas are to be kept clean and sanitary.
- 3.4** Remove nails from scrap lumber prior to storage or disposal.
- 3.5** Clean up spills of oil, grease, or other liquids immediately after they occur.
- 3.6** Work areas shall be kept neat and clear of debris and litter. Indoor areas shall be kept free of excessive dirt and dust.
- 3.7** Traffic aisles, doorways, and scaffold, stair, and ladder landings shall be kept free from scrap, debris, and tripping hazards and obstructions such as ice and snow.
- 3.8** Materials shall not be stored within 6 feet of electrical panel boxes or load centers.
- 3.9** Directional and informational signs must be clean and visible.

**4.0 SANITATION**

- 4.1** Clean drinking water in tightly closed containers and disposable cups must be provided. Water containers will be labeled to identify their contents.

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4.1.1 Drinking water containers shall be cleaned and sanitized weekly.

4.1.2 Beverages and other food items shall not be stored in drinking water containers.

4.2 Water that is derived from a private well shall be tested to verify that the water is fit for human consumption.

4.3 All outlets carrying nonpotable water shall be marked.

4.4 Workers shall be provided with restroom facilities and will be required to use them. Restroom facilities shall contain a hand-washing sink, bathroom tissue, and a door that can be locked from the inside. Restroom facilities will be marked by users' gender.

Restroom facilities shall be provided for employees according to the number of workers on the jobsite:

<u>Number of Workers</u>	<u>Toilets/Urinals</u>
Less than 20	1
20 to 200	1 toilet and 1 urinal per 40 workers
More than 200	1 toilet and 1 urinal per 50 workers

4.4.1 When chemical toilets are used on the project, the toilets shall be pumped at least weekly.

4.4.2 When chemical toilets are used at night, they shall be illuminated. Chemical toilets used in cold climates shall be heated.

4.5 Washing facilities (for hand washing or showers) shall be provided for employees using paints, coatings, or chemicals, or working in other operations where contaminants may be harmful to workers. Where such facilities are provided, workers will be required to use them.

4.5.1 Washing facilities will be equipped with soap, towels, and other supplies necessary for cleansing. As necessary, the water shall be heated.

4.5.2 Shower facilities shall be equipped with hot and cold water, heaters, ventilation, lights, privacy curtains, and doors that can be locked from the inside.

4.6 Areas shall be designated for eating, drinking, and the use of tobacco products.

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- 4.7 Refrigerators and coolers used to store laboratory samples shall be clearly labeled "NOT FOR FOOD STORAGE."

**5.0 LIGHTING**

- 5.1 Construction areas, ramps, runways, corridors, offices, shops, and storage areas shall be lighted to not less than the minimum illumination intensities listed below while any work is in progress.

<u>Foot Candles</u>	<u>Areas of Operation</u>
3	General construction areas, concrete placement, excavations and waste areas access ways, active storage areas, loading platforms, refueling areas, and field maintenance areas.
4	Warehouses, indoor corridors and hallways, and tunnels, shafts and general underground work areas.
10	General construction plants and shops, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active storerooms, and indoor toilets and workrooms. Headings during drilling, mucking, and scaling in tunnels and shafts.
30	Offices and first aid stations.

**6.0 COMPRESSED GAS CYLINDERS**

- 6.1 Valve protection caps shall be in place when compressed gas cylinders are transported, moved, or stored.
- 6.2 Cylinder valves shall be closed when work is finished and when cylinders are empty or are being moved.
- 6.3 Compressed gas cylinders shall be secured (roped, chained, or racked) in an upright position at all times except when cylinders are actually being hoisted or carried.
- 6.4 Cylinders shall not be hoisted with the valve cap, a magnet, or a choker sling. Lift cylinders in a secure cradle or basket.
- 6.5 Cylinders shall be labeled to identify the type of gas they contain and the status of the cylinders (empty, full, in use). Cylinders will be stored by their status (empty or full).

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**6.6** Flammable compressed gases shall be stored away from oxygen cylinders by a minimum distance of 20 feet.

**7.0 WASTE DISPOSAL**

**7.1** Suitable receptacles shall be provided for waste and scraps. Nonhazardous waste and hazardous waste shall be disposed of and stored in separate receptacles. Receptacles shall be covered.

**7.2** Waste such as oily rags shall be stored in approved self-closing containers.

**7.3** Receptacles containing hazardous waste shall be labeled in accordance with U.S. Environmental Protection Agency (USEPA) requirements.

**7.4** Disposal of all waste shall be in accordance with applicable environmental laws and regulations.

**8.0 INSPECTIONS**

Frequent housekeeping inspections shall be made by supervisory personnel to confirm the following:

- Trip hazards and hazards caused by tools and equipment have been eliminated.
- Incoming materials are secured to prevent tipping or rolling.
- Trash is secured in covered containers.
- Litter is picked up.
- Scrap lumber with protruding nails, pipe, sawdust, snow, and all other debris have been cleared from work areas, passageways, stairs, and in and around buildings and other structures.

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**MWHC HEALTH AND SAFETY PROCEDURES**Revision: —  
Issued: 04/04**14.03 MOTOR VEHICLES**

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**1.0 OBJECTIVE**

The objective of this procedure is to prevent motor vehicles incidents involving vehicles driven by employees of MWH Constructors, Inc. (MWHC) or vehicles operating on projects.

**2.0 PURPOSE**

The purpose of this procedure is to establish guidelines for the prevention of motor vehicle incidents and the consequent damage to property and injury to people.

**3.0 APPLICATION**

This procedure covers all motor vehicles that are owned, leased, or rented by MWHC. In addition, the procedure covers all other motor vehicles used on MWHC projects or for company business. Motor vehicles covered by this procedure include passenger cars, pickup trucks, vans, dump sports utility vehicles (SUVs), trucks, service trucks, all terrain vehicles (ATVs), and ready-mix trucks.

**4.0 OPERATING RULES**

- 4.1** The driver of a motor vehicle shall have a valid driver's license for the type or class of vehicle that he or she is assigned to operate. Unlicensed persons are not permitted to drive motor vehicles.
- 4.2** Drivers are responsible for making regular inspection of their vehicles. As applicable, inspection shall be done in accordance with the manufacturer's recommendations found in the owner's manual. Unsafe vehicles shall not be used until repairs are made.
- 4.3** All vehicles used on a project shall be equipped with a fire extinguisher. MWHC project vehicles shall be equipped with a 16-unit first-aid kit.
- 4.4** Drivers shall use the vehicle's restraints (e.g., seatbelts and shoulder harnesses) when the vehicle is in motion. It shall be the responsibility of the driver to verify that all passengers use restraint devices.
- 4.5** When drivers and passengers are mounting and dismounting trucks, they shall maintain 3 points of contact at all times. Handholds and footsteps shall be kept free of grease and mud.

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- 4.6 Drivers are responsible for obeying posted speed limits and shall give due regard to the weather, traffic, intersections, the width and character of the roadway, the type of motor vehicle being driven, and other existing conditions.
- 4.7 Drivers are responsible for keeping the vehicle's interior clean. Loose items shall be secured to prevent them from rolling.
- 4.8 Vehicles shall not be left unattended until the motor has been shut off, the key removed, parking brake set, and the transmission engaged in low, reverse, or park. If the vehicle is stopped on a grade, the wheels shall be turned into the curb. On large vehicles, the wheels shall be securely chocked.
- 4.9 Drivers shall not use cellular telephones while they are driving. If it is necessary to use a cellular telephone, drivers shall pull over and park. Follow the advice of the popular safety slogan: Hang up and drive!
- 4.10 Drivers and passengers shall not consume alcoholic beverages in a vehicle. Driving under the influence of illegal drugs or alcohol is prohibited.
- 4.11 All motor vehicle accidents shall be reported to the Regional Safety Manager or the Project Superintendent.
- 4.12 Ready-mix trucks shall not travel through the jobsite with the chute extended.

**5.0 TRANSPORTING PERSONNEL**

- 5.1 The number of passengers in passenger vehicles shall not exceed the number of seats.
- 5.2 Trucks used to transport personnel shall be equipped with a securely anchored seating arrangement, rear tailgate, and guardrails. Steps or a ladder for mounting and dismounting shall be provided.
- 5.3 Personnel are not permitted to ride with arms or legs outside of a vehicle body. Personnel must be sitting in passenger seats or in an anchored seating arrangement. Personnel shall not be transported while they are in a standing position on the body of the vehicle, while they are seated or standing on running boards, or while they are seated on side fenders, cabs, cab shields, or behind or on top of a load.
- 5.4 Vehicles transporting employees shall not be moved until the driver has ascertained that all passengers are seated and the guardrails and rear tailgate are in place or the doors are closed.
- 5.5 Dump truck bodies shall not be used to carry workers.

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5.6 Mounting and dismounting any vehicle in motion is prohibited.

**6.0 DUMP TRUCKS**

- 6.1 All dump trucks shall be equipped with fire extinguishers and backup alarms or proximity sensors.
- 6.2 When practical and feasible, consideration shall be given to the use of straight trucks or straight trucks and pup trailers over the use of semi-trailer dumps.
- 6.3 Semi-trailer dumps shall be equipped with a slope indicator or other suitable protective system that will prevent the raising of the dump trailer when the trailer is not level. Telescopic trailers shall be unloaded on level and compacted ground.
- 6.4 Dump trucks shall be equipped with a holding device to prevent accidental lowering of the body while maintenance or inspection is being performed. No person shall place any body part between the raised dump body and frame unless the holding device is engaged.
- 6.5 All workers shall stay clear of the tailgate swing and shall not place body parts (hands or head) between the open tailgate and dump body. Debris lodged in the tailgate shall be cleared with long-handled tools.
- 6.6 Dump trucks shall be equipped with a tarp and all loads shall be covered before travel.

**7.0 VEHICLE BACKING**

- 7.1 All vehicles with an obstructed view to the rear shall be equipped with a functional backup alarm or proximity sensor.
- 7.2 Before backing up or maneuvering a vehicle in a congested work area, the driver shall walk behind the vehicle to view the area for possible hazards such as debris on the ground, open holes, obstructions, and people.
- 7.3 A trained signalperson shall be used when vehicles are backed up in the following situations:
- The work area is congested.
  - The terrain is hazardous.
  - Vehicles are backed up more than 100 feet.
  - Two or more vehicles are backing up in the same area.
- 7.4 The following ground rules apply for backing up vehicles:

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- Get out and walk around the vehicle to make sure the way is clear. If the path of travel is clear, back up immediately.
- Sound the horn at least twice to warn anyone in the area that you are going to move.
- Use mirrors to check for personnel at the sides or rear of the vehicle.
- Back up with the clearance on your side.
- Stop immediately if anyone disappears from view behind you. Don't move until you see the person again. If necessary, get out and check where the person is.
- When other equipment is backing up in the same area, remain in your vehicle if possible.

**8.0 TOWING**

- 8.1** All towing devices used in any combination of vehicles shall be structurally adequate for the weight drawn and shall be properly mounted.
- 8.2** When towed on public a highway, trailers and tag-along units shall be equipped with working signal lights and brake lights.
- 8.3** A locking device or double safety system shall be provided on every fifth wheel mechanism and tow bar arrangement to prevent the accidental separation of towed and towing vehicles.
- 8.4** Every trailer shall be coupled with safety chains or cables to the towing vehicle. Such chains prevent the separation of the vehicles in case of tow bar failure.
- 8.5** Trailers equipped with power brakes shall be equipped with a breakaway device that effectively locks up the brakes in the event the trailer separates from the towing vehicle.
- 8.6** When towed units such as generators, pumps, light plants, and compressors are released from the towing vehicle, the stabilizer leg(s) shall be lowered and the wheels of the towed unit shall be chocked.
- 8.7** When trailers such as box trailers are not coupled to a tractor, they shall be adequately supported on solid ground by their support legs and fixed jacks.
- 8.8** 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 by powered industrial trucks.

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- 8.9** Equipment such as mobile construction equipment shall not be loaded onto a trailer that is not coupled to the towing vehicle tractor unless the trailer has been designed to function without being coupled to the towing vehicle (e.g., gooseneck lowboy).
- 8.10** Employees shall not be permitted to get between a towed and towing vehicle except when hooking or unhooking the vehicles. When hooking or unhooking the vehicles, workers must watch where they place their hands to avoid being caught between the tow bar and the hitch.

**9.0 LOADING VEHICLES**

- 9.1** No vehicle or combination of vehicles hauling unusually heavy loads or equipment shall be moved until the driver has been provided with the required permits and the correct weights of the vehicles and load.
- 9.2** The rules for the mobilization and demobilization of heavy equipment shall be followed. See 9.05 Heavy Equipment of the MWHC Safety Manual for rules and guidelines on operating and handling heavy equipment.
- 9.3** The load on every vehicle shall be distributed, chocked, tied down, or secured. Loads shall be covered when there is the hazard of dirt, debris, or material falling or flying out of the load.
- 9.4** Loads shall not obscure the driver's view or the vehicle's lights or reflectors.
- 9.5** Vehicles carrying loads that project beyond the sides or rear of the vehicle shall carry a red flag of least 12 square inches (3 inches x 4 inches) at or near the end of the projection. At night or when visibility is restricted, a warning light shall be used in lieu of the red flag.

**10.0 ALL TERRAIN VEHICLES**

- 10.1** Every all terrain vehicle (ATV) operator shall possess a valid state driver's license and shall have completed an ATV training course before operating of the vehicle.
- 10.2** Only ATVs with four or more wheels shall be used.
- 10.3** While operating an ATV, drivers shall wear gloves; an approved motorcycle helmet with a full-face shield or goggles, boots, long pants, and a shirt at all times.
- 10.4** ATVs are to be used off-road only (do not drive them on paved roads). When ATVs must be used on a haul road or an access road used by other vehicles and heavy

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equipment, the ATV operator shall wear a brightly colored traffic safety vest and travel with lights on; the ATV shall be equipped with florescent pendant visible to the drivers of all other vehicles.

**10.5** ATVs shall be driven during daylight hours only.

**10.6** Passengers are prohibited on ATVs.

**10.7** All ATVs shall be equipped with a warning signal device (a horn).

**11.0 MAINTENANCE AND REPAIRS**

**11.1** The vehicle's engine must be turned off during refueling.

**11.2** Containers used for flammable liquids shall be removed from a vehicle (pickup truck with bed liners) before the container is filled.

**11.3** During the charging or jumpstarting of a battery, cell caps shall be removed and the opening covered with a damp rag. The jumper cables shall be connected in the following sequence:

1. The positive cable is attached to the positive terminal of the dead battery.
2. The other clamp of the positive cable is attached to the positive terminal of the good battery.
3. The negative cable is attached to the negative terminal of the dead battery.
4. The other clamp of the negative cable is attached to the engine block or the frame of the vehicle with the good battery.

The cables must be attached firmly to prevent sparks. To prevent explosions, flashlights should be used to check electrolyte levels. Workers charging or jumpstarting a battery shall wear eye and face protection and shall stand clear of the battery.

**11.4** To check the pressure of tires or to inflate them, a clip-on chuck equipped with an inline valve with a gauge or pressure regulator preset to the desired pressure shall be used. The chuck shall have a hose long enough to permit the worker to stand clear while the tire is being checked or inflated.

**11.5** A safety tire rack, cage, or equivalent protection shall be provided and used when tires installed on split rims or rims equipped with locking rings or similar devices are inflated, mounted, or dismounted.

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**17.01 POWER TOOLS****1.0 OBJECTIVE**

The objective of this procedure is to prevention of incidents associated with the use of power tools by MWH Constructors, Inc. (MWHC) employees. The provisions of the procedure apply to power tools and equipment furnished by employees as well as to tools and equipment owned by the Company.

**2.0 PURPOSE**

This procedure establishes guidelines for the care and safe use of all power tools, including electric, pneumatic, and fuel-operated tools used on MWHC projects.

**3.0 CARE OF POWER TOOLS**

- 3.1** All power tools shall be maintained in a safe working condition and shall be inspected prior to use. Defective power tools shall not be used and shall be tagged "OUT OF SERVICE" until repairs can be made.
- 3.2** When not in use, power tools shall be stored in suitable boxes or containers or shall be hung on racks. Tools shall not be left in walkways or other places where there is a chance that the tool will fall or create a tripping hazard. Cutting edges shall be protected and tools shall not be left where they will roll off benches or tables. Storage areas shall be kept free from moisture to prevent corrosion.
- 3.3** Damaged or worn tools shall be promptly and properly repaired. Temporary and makeshift repairs are prohibited. If tools cannot be repaired on the job, they shall be sent to the factory or a shop for repairs. Tools that cannot be repaired shall be discarded.
- 3.4** Power tools shall be protected against corrosion damage. Accumulated grease, dirt, sawdust, and moisture shall be promptly removed, and power tools shall be cleaned thoroughly when necessary with a nonflammable, nonirritating solvent and wiped clean. Moving and adjustable parts shall be lubricated as necessary.

**4.0 WORK PRACTICES**

- 4.1** Power tools shall be selected based on their weight and size and the type of tool needed for the job. Tools shall not be used for anything other than their intended purpose and shall not be altered or modified.
- 4.2** Workers shall use only power tools with which they have experience with or on which they have been trained to use.

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- 4.3 Prior to use, all power tools and their accessories shall be inspected and tested in accordance with the manufacturer's instructions. Defective power tools shall not be used and shall be tagged "OUT OF SERVICE" until repairs can be made.
- 4.4 Employees who use power tools shall be provided with and required to wear personal protective equipment (PPE), including eye and hearing protection, as necessary to protect them from the hazards involved.
- 4.5 All guards originally supplied with power tools shall be in place when the tool is in use. Guards shall not be altered, modified, or defeated.
- 4.6 If hand-held power tools are equipped with a constant pressure switch (a dead man switch), the switch shall not be defeated (taped or wired) in order to keep the power on.
- 4.7 Tools shall be disconnected from the power source before accessories are changed or repairs are made.
- 4.8 When using power tools, workers shall ensure that they have proper footing and balance and that there is adequate lighting. As necessary, the work shall be secured with clamps, jigs, or a vise. Workers must never attempt to hold or secure the material or item being worked on with their hands or feet, nor shall someone else hold the work.
- 4.9 Before drilling, nailing, cutting, or sawing is done into walls, ceilings, or floors, a check for electrical wires and other utilities shall be made.

**5.0 ELECTRICAL TOOLS**

- 5.1 Electric-power-operated tools shall be approved double-insulated tools, or they shall be battery operated or grounded. An inline ground-fault circuit interrupter (GFCI) shall be used with electrically powered equipment and tools unless tools are double insulated or battery operated.
- 5.2 The ground plug shall not be removed from power tools and extension cords. Power tools and extension cords shall be equipped with dead front plugs.
- 5.3 Extension cords shall be protected from damage (e.g., being cut through or run over), and they must not create a trip hazard. Extension cords shall not be run through doors, windows, or floor openings. Extension cords must be inspected prior to use.
- 5.4 Tools shall not be hoisted or lowered by their electrical cords.

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- 5.5** Workers shall unplug electrical tools from the power source when changing attachments and making minor adjustments or repairs. Workers shall keep the plug of the tool's cord in sight when changing attachments or making repairs.
- 5.6** Electrical tools shall not be used in wet areas or areas where flammable vapors may be present unless they are specifically designed for that purpose.

**6.0 PNEUMATIC TOOLS**

- 6.1** The air-supply hoses of pneumatic tools shall be protected from damage by vehicles, and must not create a trip hazard. Air-supply lines carried overhead or vertically shall be supported with a messenger cable or shall be otherwise properly supported.
- 6.2** Pneumatic power tools and their hoses shall be secured to prevent the tools and hoses from being disconnected. Air-supply hoses with an inside diameter greater than 1/2 inch shall be wired, cabled, chained, or otherwise secured, and must have a shut-off valve at the source.
- 6.3** Pneumatic tools shall not be hoisted or lowered by their air-supply lines.
- 6.4** All pneumatic impact tools shall have safety clips or retainers that prevent dies and tools from being accidentally expelled from the barrel.
- 6.5** The manufacturer's recommended safe operating pressure for pneumatic tools, and their hoses, valves, pipes, filters, and other fittings shall not be exceeded.
- 6.6** Compressed air shall not be used for cleaning purposes except when the air pressure is reduced to less than 30 pounds per square inch (psi) and then only when effective chip guarding and personal protective equipment (PPE) is used. Compressed air shall not be used to blow dust or debris off clothing.
- 6.7** Pneumatic tools shall be disconnected from the hose before any adjustments or repairs to it are made.
- 6.8** All automatic and manual safety devices (e.g., the tip of the air nailer that prevents firing without contact with the work) must be operating properly. Additionally, screens should be set up to protect bystanders from flying debris when chippers, air drills, or any other tools that could cause injury to others are used.

**7.0 FUEL-POWERED TOOL**

- 7.1** Fuel-powered tools shall be shut off while being refueled, serviced, or maintained. Workers shall make sure that a tool has had time to properly cool before attempting to refuel it.

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7.2 When workers are using fuel-powered tools in an enclosed space, the space shall be ventilated to prevent high levels of carbon monoxide or other toxic gases from building up.

**8.0 SPECIFIC POWER TOOLS****8.1 Jackhammers and Rotary Drills**

8.1.1 All bolts shall be checked regularly to verify they haven't loosened.

8.1.2 Tools must be kept sharp.

8.1.3 Chuck bushings and hammers must be in good condition.

8.1.4 Where applicable, workers using jackhammers and rotary drills shall wear steel metatarsal coverings over the whole foot, not just the toe.

8.1.5 Jackhammers and rotary drills must have the following safety equipment:

- A locking mechanism on the drill bit
- An instant trigger control and automatic release
- A hand guard extending from the handle to the body of the tool

8.1.6 Where jackhammers and rotary drills are used to disturb masonry and concrete products, engineering or work practice controls shall be implemented to reduce (silica) dust. When engineering or work practice controls are not feasible, employees exposed to dust shall use respiratory protection.

Suggested engineering controls and work practice controls for jackhammers and rotary drills include the following:

- Employ wet methods.
- Connect the tool to a point-of-operation dust collection system.
- Stand upwind while using these tools.
- Limit the number of workers in the work area. (Workers who are in the area must use respiratory protection.)
- Contain the work area.
- Use a ventilation system that removes and collects dust. (Workers' in containment must use respiratory protection.)

**8.2 Circular Saws**

8.2.1 Teeth on the upper half of the saw blade must be permanently guarded.

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**8.2.2** Teeth on the lower half of the saw blade must be guarded with a telescopic or hinged guard.

**8.2.3** Guards shall not be blocked open to prevent them from functioning.

**8.3 Gasoline-Powered Saws**

**8.3.1** Gasoline-powered saws shall be equipped with a switch that returns the motor to idle when released.

**8.3.2** When a worker is transporting a gasoline-powered saw by hand, he or she shall stop the engine, grip the saw handle, place the muffler at the side away from his or her body, and position the guide bar to the rear.

**8.3.3** The chain brake shall not be removed, and the handles, chain brake, chain, or covers shall not be altered.

**8.3.4** Workers shall always start saws on the ground. The proper procedure is to engage the chain brake; place one foot through the bottom handle, hold the top handle, and pull the starter rope. Workers must not place the saw on their knees when starting it.

**8.3.5** The clutch must be kept adjusted to prevent the chain drive from engaging at idle speed.

**8.3.6** Workers shall always use both hands to maintain control of the saw and position themselves to avoid injury in case of kickback.

**8.3.7** When moving from tree to tree or cut to cut, workers shall activate the chain brake, remove their finger from the trigger, and keep the bar or wheel away from their body.

**8.3.8** Workers shall not operate a saw above shoulder height.

**8.3.9** Workers shall keep the nose of the bar clear of nearby objects during cutting to prevent kickback.

**8.3.10** Workers shall not set a saw down while the blade is engaged. The engine must be stopped and the switch turned off when the saw is left unattended.

**8.3.11** When a worker is using a chain saw, he or she will wear protective clothing such as protective chaps, sleeves, vests, and other protective garments as needed.

**8.3.12** When saws are used to disturb masonry and concrete products, engineering or work practice controls shall be implemented to reduce (silica) dust. When

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engineering or work practice controls are not feasible, employees exposed to dust shall use respiratory protection.

Suggested engineering controls and work practice controls include the following:

- Employ wet methods.
- Connect the tool to a point-of-operation dust collection system.
- Stand upwind while using these tools.
- Limit the number of workers in the work area. (Workers who are in the area must use respiratory protection.)
- Contain the work area.
- Use a ventilation system that removes and collects dust. (Workers' in containment must use respiratory protection.)

#### **8.4 Table, Bench, and Radial Arm Saws**

- 8.4.1** Workers shall keep the operating table where a table, bench, or radial arm saw is used and the surrounding area clean and clear of all debris.
- 8.4.2** Workers shall use eye and hearing protection and other appropriate protective gear when using these saws.
- 8.4.3** Before using a saw, workers shall make sure that blade guards, complete with a splitter and nonkickback attachment, are in place and operating freely.
- 8.4.4** Saw blades must be sharp and suitable for the job.
- 8.4.5** "Pusher" sticks are required for ripping.
- 8.4.6** Saws shall be turned off when not in use.
- 8.4.7** Workers shall never reach around, over, or behind a running blade to control the stock.
- 8.4.8** Workers shall hold the piece being cut firmly against the guide or fence, and shall cut all material in a single, steady pass. It is dangerous to stop the saw for any reason before the cut is completed. If for some reason a cut must be interrupted before it is completed, the blade should be turning freely and at full speed before cutting is resumed.
- 8.4.9** With conventional table saws, a long fence is necessary. Workers shall use extension tables or roller stands and shall get help from other employees as necessary when handling large stock.

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**8.4.10** The cutting head on radial arm saws must automatically return to the column stop when the yoke is released. Adjusting the front end of the unit slightly higher than the rear will verify that the cutting head will gently return to the column stop.

**8.5 Portable and Bench Grinders**

**8.5.1** All portable grinders shall be equipped with a hood guard.

**8.5.2** Workers operating a portable or bench grinder must use eye and face protection.

**8.5.3** Wheels shall be inspected regularly. A cracked wheel must be replaced because it may break into pieces. Wheels that are worn or are covered with debris must be replaced.

**8.5.4** Wheels must have the proper rpm rating.

**8.5.5** Workers shall anchor bench grinders as necessary to prevent them from tipping or moving because of vibration.

**8.5.6** Workers shall verify that tool rests and tongue guards are in place and properly adjusted. The tool rest should be kept adjusted to a clearance not to exceed 1/8 inch between the tool rest and the surface of the wheel. The tongue guard should be adjusted to a clearance not to exceed 1/4 inch between the tongue and the surface of the wheel.

**8.6 Abrasive-Blade and Carbide Tools**

**8.6.1** With abrasive or carbide-tipped blades and carbide tools, it is essential that the proper saw blade be selected for the particular material being worked on. The saw blade must be mounted tightly, securely, and in the correct rotation direction, according to the manufacturer's instructions.

**8.6.2** When the saw blade is being mounted or changed, the power supply to the saw shall be disconnected.

**8.6.3** A blade guard shall be used and must cover a substantial portion of the saw blade. The guard shall be replaced when worn or damaged.

**8.6.4** When operating an abrasive blade tool, workers shall wear eye and face protection, hearing protection, and other appropriate protective gear as necessary.

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- 8.6.5** A worker operating an abrasive-blade tool shall position his or her body to the side of the blade, not directly behind it.
- 8.6.6** Jamming, grinding and extensive side pressure on the wheel must be avoided.
- 8.6.7** Workers must concentrate on the work surface, making sure the blade does not come into contact with anything other than the material being cut.
- 8.6.8** Abrasive blades shall be stored upright in a dry area, and proper maintenance procedures established by the manufacturer shall be followed.
- 8.6.9** Where abrasive-blade tools are used to disturb masonry and concrete products, engineering or work practice controls shall be implemented to reduce (silica) dust. When engineering or work practice controls are not feasible, employees exposed to dust shall use respiratory protection.

Suggested engineering controls and work practice controls include:

- Employ wet methods.
- Connect the tool to a point-of-operation dust collection system.
- Stand upwind while using these tools.
- Limit the number of workers in the work area. (Workers who are in the area must use respiratory protection.)
- Contain the work area.
- Use a ventilation system that removes and collects dust. (Workers' in containment must use respiratory protection.)

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**1.0 OBJECTIVE**

The objective of this procedure is to prevent incidents related to welding and cutting operations as performed on MWH Constructors inc. (MWHC) project sites.

**2.0 PURPOSE**

The purpose of this procedure is to provide guidance for the safe use and operation of welding and cutting equipment, and to protect employees and property from harm when these operations are conducted.

**3.0 DEFINATIONS**

For the purpose of this procedure welding and torch cutting is process that generates significant amount of heat to melt metal. The hazards associated with this process are fires, electrical shock and personal injury.

**4.0 GENERAL SAFETY GUIDELINE**

- 4.1 The welder or torch – cutter shall survey the work areas for combustible and flammable materials, chemical, etc.), and eliminate or control these hazards before welding or torch-cutting activities are conducted.
- 4.2 Supervisors shall coordinate all welding and torch activities with owners/operators of facilities where MWHC performs work before work is conducted.
- 4.3 Welding on structural or critical items, such as scaffolding, shoring, forms, ladders, piling, etc., shall be performed by a certified welder using qualified welding procedures.
- 4.4 Engine driven equipment shall have enclosures and guards in place and be turned off before refueling, servicing, or replacing mechanical parts.
- 4.5 Welding and torch cutting apparatus and equipment shall be inspected daily prior to use. Defective apparatus and equipment shall be removed from service, replace, or repaired and reinspected before being used again.
- 4.6 Persons engaged in welding or torch cutting operations including helper shall wear the necessary protective equipment to prevent exposure to UV rays, flashes, sparks, and molten metals.

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- 4.7 Where it is necessary to protect nearby workers and other from the UV rays, flashes, sparks and molten metals, non-flammable protective screens or curtains shall be erected.

**5.0 FIRE PREVENTION****5.1 Prevention Techniques**

- 5.1.1 Welding, cutting or burning shall, whenever possible, be confined to area free of combustible and flammable materials. When this is not possible, all combustible and flammable material shall be removed or protect from fire, spark, and slag.
- 5.1.2 No welding, cutting, or burning shall be done in areas containing flammable and/or combustible liquids, vapors, or dust. Until the atmosphere has be tested and found safe.
- 5.1.3 Where welding, cutting, or burning is performed outside of the shop area, supervisory personnel verify that the area is free of combustible and/or flammable liquids, vapors or dusts and that atmospheric tests has been carried out.
- 5.1.4 Noncombustible barriers shall be installed below welding or burning operations in or over a shift or raise.
- 5.1.5 Where combustible materials such as paper clippings, wood shavings, or dust are on the floor, the floor shall be swept clean for a radius of 35 feet around the cutting or welding operation. Combustible floors shall be kept wet, covered with damp sand, or protected by fire-resistant shields. All floor openings or cracks shall be closed or sealed with a fire-resistant shield or covering.
- 5.1.6 Before welding, cutting, or heating any material covered by a preservative coating whose flammability is unknown, a test shall be made to determine its flammability. As necessary the surface shall be stripped for a distance of at least 4 inches from the area of the heat application.
- 5.1.7 Fire extinguishers rated 2-A: 40-B: C units or larger shall be immediately available whenever welding or cutting is being carried out.
- 5.1.8 Reverse flow check valves shall be installed between the hose and torch inlet.

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Flashback arrestors shall be installed in front of gas regulators.

- 5.1.9** All cylinders shall be shut off and regulator screws backed out completely. Wrenches and keys shall be left in all fuel gas cylinders. All oxy-fuel gas cylinders shall be transported with the regulators removed and the cylinder caps replaced. Empty cylinders shall be marked empty.
- 5.1.10** Oxygen shall not be used to blow clothing off, workbenches or for purging vessels. Oxygen shall not be connected to compressed air tools. **CAUTION:** Pure oxygen under pressure can cause spontaneous combustion in contact with grease and oil. Never bring these substances together.

**5.2 Hot Work Permit**

- 5.2.1** When welding, cutting or heating is such that normal fire prevention precautions are not considered adequate, as determined by the Health and Safety Supervisor, a Hot Work Permit (Form FP-1; see Attachment B of 07.02 Fire Prevention) shall be issued.
- 5.2.2** Supervisory personnel shall verify that the conditions of the Hot Work Permit are implemented.
- 5.2.3** A fire watch shall be required whenever welding or cutting is performed in locations where combustible materials are closer than 35 feet away from the point of operations, or where significant amounts of combustibles are more than 35 feet away but are easily ignited by sparks.
- 5.2.4** A fire watch shall be required when 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. The fire watch shall be maintained for at least a half-hour after completion of welding or cutting operations, so that possible smoldering fires will be detected and extinguished. The firewatcher shall be equipped with a fire extinguisher and a means for sounding the fire alarm.

**6.0 ARC WELDING****6.1 Welding Machine**

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- 6.1.1 The welding machine shall conforming to the requirements of the National Electrical Manufacturers' Association or listed by Underwriters' Laboratories.
- 6.1.2 The welding machine shall be installed, inspected, and maintained in accordance with the manufactures written instructions.
- 6.1.3 When welding machines are used outside, they shall be protected from rain and snow in such a way that ventilation is not impaired.
- 6.1.4 Welding machines should be stored in a clean, dry area.
- 6.1.5 Frames or cases of welding machines (except engine driven) operated from power circuits shall be grounded.
- 6.1.6 Before working on the welding machine it shall be disconnect from the power supply.

**6.2 Welding Cables**

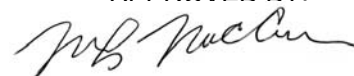
- 6.2.1 Cables shall be inspected before use for wear and damage. Those with damaged insulation, conductors, or connection must be repaired or replaced.
- 6.2.2 Cables shall be properly and completely insulated, flexible, capable of handling the maximum current requirements of the work and properly connected.
- 6.2.3 Damaged to insulation can be repaired with rubber and electrical tape, except within 10 feet of the end of the cable with the electrode holder. Devices with adequate insulation intended for this specifically for splicing must be used within 10-feet of the electrode holder.
- 6.2.4 Cables shall be kept dry and free of oil and grease.
- 6.2.5 Cables shall be neatly uncoiled before using to prevent damage to the insulation. The welder cables should be positioned so that sparks and molten metal will not fall on them. Cables shall be laid out to prevent entanglement or tripping. Cables should not lie in roadways, water, oil, ditches, and bottom of tanks, stairways, or ladders.
- 6.2.6 When work is at a distance from the welding machine, cables should be supported overhead. When this is impractical, they shall be laid on the ground and protected from damage.

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**6.3 Ground Returns**

- 6.3.1** All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current
- 6.3.2** Welding current should be returned to the welding machine by a single work lead from the weldment to the appropriate connector on the welding machine.
- 6.3.3** Where it is necessary to pass the return current through a conductor or structure on which the weldment rests or to which the weldment is connected, it shall be determined that the required electrical contact exists at all join. The generation of an arc, spark, or heat at any point should cause rejection of that conductor as a return ground.
- 6.3.4** Pipelines containing flammable gases or liquids, electrical conduit, chains, wire rope, crane hoist or similar devices shall not be used for a ground. Where a chain or hoist supports the weldment, an insulating link shall be installed on the master link.

**6.4 General Arc Welding Precautions**


- 6.4.1** 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. Electrodes or welding leads must never be draped over wire rope guardrails, utilities, or other conductors otherwise come into contact with them.
- 6.4.2** When the welder has occasion to leave his/her work or stop work for any appreciable length of time, or when the arc-welding machine is to be moved, the machine shall be turned off.
- 6.4.3** Protect yourself from electric shock by insulating yourself from work and ground. Use non-flammable, dry insulating material if possible, or use dry rubber mats, dry wood or plywood, or other dry insulating material big enough to cover your full area of contact with the work or ground, and watch for fire.
- 6.4.4** Electrode holders should never be dipped in water for cooling purposes.
- 6.4.5** Welding should never be done directly on a concrete floor. Heat from the arc can cause steam to build-up in the floor, which could cause the concrete to explode.

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- 6.4.6 Workers shall not place their body between the two cables, coil the electrode lead around their body, or work directly next to the welding power source. Do not lean against the workpiece or weld if clothing is wet.
- 6.4.7 If using auxiliary power, GFCI protection is required on electric power cords unless double insulated tools are used.
- 6.4.8 Plastic disposable cigarette lighters are very dangerous around heat and flame. It is very important that they not be carried in the pockets while welding.
- 6.4.9 Where compressed gas cylinders are used they shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.

**7.0 GAS CUTTING/WELDING****7.1 Regulator**

- 7.1.1 Regulators shall be inspected at the beginning of each work shift and shall be in proper working order while in use. Defective regulators shall be removed from service. A factory-trained technician shall make repair to regulators.
- 7.1.2 Only pressure regulators that are approved by either Factory Mutual or Underwriters Laboratories should be used.
- 7.1.3 Pressure regulators shall be used on both oxygen and fuel gas cylinders to maintain a uniform gas supply to the torches at the correct pressure.
- 7.1.4 A one-way check valve shall be installed at the outlet of the oxygen and fuel gas regulators.
- 7.1.5 Before a regulator is connected to a cylinder valve, 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.

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7.1.6 Regulators and gauges. Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use.

**7.2 Cylinders (also procedure 09.06 Housekeeping)**

- 7.2.1 Oxygen and fuel gas shall not be used from cylinders through torches or other devices that are equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve.
- 7.2.2 Tilting and rolling them on their bottom edges shall move cylinders. They shall not be intentionally dropped, struck, or permitted to strike each other violently.
- 7.2.3 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 sling.
- 7.2.4 When cylinders are transported by powered vehicles, they shall be secured in a vertical position.
- 7.2.5 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.
- 7.2.6 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.
- 7.2.7 A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.
- 7.2.8 When work is finished, when cylinders are empty, or when cylinders are moved at any time, the cylinder valve shall be closed.
- 7.2.9 Compressed gas cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.
- 7.2.10 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.

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- 7.2.11** 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, exists, 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 by unauthorized persons. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards.
- 7.2.12** 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.
- 7.2.13** 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.
- 7.2.14** 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 be subject to open flame, hot metal, or other sources of artificial heat.
- 7.2.15** Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.
- 7.2.16** No damaged or defective cylinder shall be use.
- 7.2.17** Valve protection caps shall be in place and secured to all cylinders not in use.
- 7.2.18** Employees shall not attempt to refill any compress gas cylinder.

**7.3 Connecting Cylinder to Regulator**

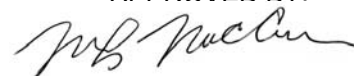
- 7.3.1** Before a regulator to a cylinder valve is connected, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The person cracking the valve shall stand 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.
- 7.3.2** The cylinder valve shall always be opened slowly to prevent damage to the regulator. For quick closing, valves on fuel gas cylinders shall not be opened more than 1 1/2 turns. When a special wrench is required, it shall be left in

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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.

- 7.3.3** Attach the regulator with a wrench and do not overtighten. Always use proper fitting wrenches when making connections. Do not use vise grips or pipe wrenches. Oxygen cylinders have a right-hand thread (clockwise). Fuel gas cylinders have a left-hand thread (counterclockwise). Avoid cross-threading or damaging brass parts.

**CAUTION:** Some propane regulators are interchangeable with acetylene regulators. Propane regulators are usually set for 50 psi while acetylene regulators operate at 5 psi. Using a propane regulator on an acetylene cylinder without adjusting the operating pressure can cause serious flashback. Check the setting on the dial before using.

- 7.3.4** Before a regulator is removed from a cylinder valve, the cylinder valve shall always be closed and the gas released from the regulator.
- 7.3.5** 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.
- 7.3.6** 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.

**7.4 Hoses**

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- 7.4.1** All hose carrying oxygen, 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.
- 7.4.2** Fuel gas hose 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. A single hose having more than one gas passage shall not be used.
- 7.4.3** 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.
- 7.4.4** 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 300 p.s.i. Defective hose, or hose in doubtful condition, shall not be used.
- 7.4.5** Hose couplings shall be of the type that cannot be unlocked or disconnected by means of a straight pull without rotary motion.
- 7.4.6** Boxes used for the storage of gas hose shall be ventilated.
- 7.4.7** Hoses, cables, and other equipment shall be kept clear of passageways, ladders and stairs.
- 7.4.8** Fuel and gas hoses and equipment shall not be interchanged to trade functions (i.e., oxygen hose used as a gas hose). Right and left threads shall not be altered to allow interchanging of hoses and connections.
- 7.4.9** Hose brought into confined spaces shall be immediately rolled back after use.

**7.5 Torches**

- 7.5.1** 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.
- 7.5.2** Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.

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7.5.3 Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.

## 7.6 Preparing the Torch

7.6.1 Turn the adjusting handle on the regulator counterclockwise to release pressure on the diaphragm spring.

7.6.2 Attach a welding or cutting tip as required.

7.6.3 Open the oxygen valve all the way. CAUTION: Always stand to the side of the regulator and slowly open the cylinder valve. Regulators have been known to explode, causing serious injury.

- Open acetylene valve no more than  $\frac{3}{4}$  of a turn.
- Open fuel gas valves slow to prevent freezing.

7.6.4 Adjust the regulator screws to show slight pressure. After purging the system, shut off the torch valves.

7.6.5 Check the manufacture's chart for proper regulator setting suited to the tip size and job application. Adjust the regulator screw to the required pressures.

7.6.6 Test the regulators, hoses, and connections for leaks and fix if necessary.

7.6.7 Open the oxygen valve on the torch handle. Adjust oxygen to the desired flow range. Then close the torch handle valve. Open the fuel valve on torch handle. Adjust fuel to the desired flow range.

7.6.8 Reopen the torch valves and light torch according to equipment manufactures procedures.

## 7.7 Using the Torch

7.7.1 Wear proper PPE to guard against the hazards that are present

7.7.2 Never burn directly on a concrete floor. The heat from the torch can cause the concrete to expand and shatter with great force. Put a piece of plate between the work and the floor, or work on a welding bench.

7.7.3 The torch must point away from the user's body and fellow workers at all time.

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**7.7.4** If you experience a backfire or flashback (a shrill hissing sound when the flame is burning inside the welding nozzle), immediately turn off the oxygen valve. Then, turn of the fuel valve. Allow the torch and nozzle to cool before attempting to reuse. If backfire and flashback reoccurs, to don't use the apparatus until repaired by a qualified repair technician.

**7.7.5** When shutting off a torch, always close the oxygen valve first and the fuel valve last

**7.8 Care of Equipment**

**7.8.1** If cutting operations will discontinue for long periods (such as during lunch), compressed gas cylinders shall be closed, torch valves and regulator pressure adjusting screws shall be opened to relieve pressure. For longer periods (over night) cylinder valves shall be closed, gas gages removed, and protective screw caps shall be replaced.

**7.8.2** When using flame-cutting equipment, the following procedures shall apply:

- Coil and hang up loose gas hoses when not in use to keep them clean and free from contamination and the risk of puncture
- Repair gas hoses with a proper coupler only
- If possible, run gas hoses through a piece of pipe or between planks to protect them from traffic
- Don't tape or cover up more that 4 inches of every 12 inches of gas hose with tape or other materials
- Never drag a torch by the hose
- Keep torch tips and threaded hose and gage connections clean of grease, oil, and slag. Clogged torch tips should be cleaned with suitable cleaning wires, drills, or other devices designed for the purpose
- Store equipment in a safe place, preferably in a box made for torch parts, hose, and regulators
- Shut off gages and close gas cylinder valves before removing them from the cylinder
- Remove gas cylinders and replace the protective valve screw cap at the end of each shift.

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**8.0 VENTILATION**

Ventilation is a necessary precaution for the removal of potentially harmful fumes out of the breathing zone of the welder. Acceptable ventilation for welding, cutting and related processes is natural and mechanical ventilation. When ventilation controls can not be implemented workers will be protected from welding fumes by the use of respiratory protection. The criteria for respiratory protection can be found in Procedure 19.01 of the Constructors Safety Manual.

Certain materials sometime contained in the consumables, base metals, coatings, or atmosphere of welding or cutting have every low exposure limits or are governed by specific OSHA standard. Among these materials are:

Antimony	Chromium	Mercury	Arsenic	Cobalt
Nickel	Barium	Copper	Selenium	Beryllium
Lead	Silver	Cadmium	Manganese	Vanadium
Fluorides	Stainless steel			

Refer to the MSDS to identify any materials listed above maybe contained in the consumable (rod, wire, flux, etc) or base metals of the weldment. Consult the applicable OSHA standard for special safety precaution that need to be taken or contact the Health and Safety Supervisor.

**8.1 Natural Ventilation**

**8.1.1** Natural ventilation is acceptable to keep the welder's breathing zone away from the plume and all of the following conditions are met.

Space of more than 10,000 cubic foot per welder is provided.

- Ceiling height is more than 16 feet.
- Welding is not done in a confined space.
- Welding spaces does not contain partitions, balconies, or other structural barriers that obstruct cross-ventilation.
- Materials covered above are not present as deliberate constituents.

**8.2 Mechanical Ventilation**

**8.2.1** The preferred method of ventilation for welding and cutting procedures is local ventilation. As applicable local ventilation (exhaust. smoke suckers, forced air) shall be used to remove fumes away from the breathing zone. Precautions shall be taken to prevent contaminates are not dispersed to other work areas. The minimum

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velocity of 100 feet per minute should be maintained for a distances of 2 feet directly above the work area.

- 8.2.2** General mechanical ventilation (wall exhaust fans, roof exhaust fans and similar air movers) should be used where applicable to reduce the levels of fumes in the work area. As a rule of thumb for general ventilation should be provided at a rate of 2000 cubic feet per minute per welder.

**8.3 Fume Avoidance**

- 8.3.1** To avoid breathing the welding or cutting fume plume, welding and cutting should be done by positioning the work, the head, or by ventilation that directs the plume away from the face.

**9.0 CONFINED SPACE**

- 9.1** Welding in cutting in confine spaces shall be done in accordance to these procedures and the criteria for confined space, which can be found in Procedure 04.01 of the Constructors Safety Manual.
- 9.2** Additional precautions for welding and cutting in confined spaces maybe recommended by the Health and Safety Supervisor after evaluating the confined spaces and purposed operations.

**10.0 DRUMS, TANKS AND CLOSED CONTAINERS**

- 10.1** Closed containers that have held flammable liquids or other combustibles shall be thoroughly cleaned and test for hazardous atmosphere before welding or cutting.
- 10.2** When the container cannot be removed for standard cleaning or as an added precaution after cleaning a container to be welded or cut may be filled with either carbon dioxide or nitrogen to dilute and render nonhazardous any remaining combustible gas or vapors. The container may also be filled with water to within an inch or two of the place where the work is to be done and the vent is left opened.

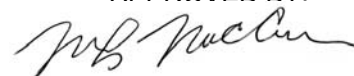
**11.0 PERSONAL PROTECTIVE EQUIPMENT**

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- 11.1** Personal clothing used for welding or torch cutting shall be oil and grease free and contain no rips or tears that, exposes the skin. Clothing made of synthetic blend should be avoided; cotton or wool blend fabric is preferred. The use of synthetic blend insulated underwear should also be avoided. Sleeves and collars should be kept buttoned. Clothing should not have pockets or cuffs where sparks or slag could get caught.
- 11.2** Procedure 17.03 of the Constructors Safety Manual contains the minimum PPE that should be worn on a project site.
- 11.3** The type of welding or cutting work and surrounding circumstances dictate to a great extent the kind of protective clothing that will be worn. As applicable the following protective clothing shall be used by welders, cutters and helpers:
- Flame-resistant gauntlet gloves-leather or other suitable material
  - Coveralls, jacket, sleeves, apron or cape, etc. made of flame-resistant material
  - Safety glasses with sideshields worn under welding helmets and faceshield.
  - Faceshield shall be used for grinding operations.
  - Welding helmet or hand- shield. Helmet must be in the down position when an arc is struck. Auto darkening helmets are acceptable.( shade level 10-14)
  - Goggles or faceshield are required for torch cutting (shade 3.0 to 5.0).
  - Conventional tinted safety glasses or eyewear shall not be used for direct viewing of welding or cutting process.
  - Hearing protection as required for noise and to keep sparks out of the ear.
  - Where there is a danger of falling objects hard hats shall be worn. The welding helmet or faceshield will be adapted to fit the hard hat.
  - Respiratory protection in accordance with Procedure 19.01 of the Constructor Safety Manual.
- 11.4** All eye and face protection shall conform to ANSI Z49.1 and Z87.1 standards. for various arc welding and gas cutting processes.
- 11.5** Protective equipment shall be inspected before use in accordance with the manufacturers requirements. Protective clothing and equipment shall be maintained in accordance with the manufactures requirements. Defective equipment shall not be used until repaired.

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**11.6** Protective clothing and equipment should be stored in a well ventilated place away from the immediate work are when not in use. The equipment must be dry and free of oil grease or orther flammable materials.

**12.0 TRAINING**

**12.1** Employees using welding and flame-cutting equipment shall be trained on the following items specific to welding or torch use

- Procedures listed in this document.
- The use, care and limitations of personal protective equipment
- The storage, handling, and use of compressed gas cylinders, welding and cutting equipment.
- Fire safety and the use of fire extinguishing equipment.
- Hazard involved with welding and cutting operations.

**12.2** Certified welders shall have available their credentials for inspection and photocopying.

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