

# SHOP DRAWING REVIEW FORM AND TRANSMITTAL

**DATE:** November 4, 2021

**TO:** Carl Hendrickson  
Project Manager  
Veolia Water  
825 West Water Street  
Taunton, MA 02780

**FROM:** Michael Andrus, P.E.  
Project Manager  
BETA Group, Inc.  
701 George Washington Hwy  
Lincoln, Rhode Island 02865

**RE:** City of Taunton, MA  
WWTF Phase 1 Improvements  
Contract S-2021-1

Shop Drawing No. 01069-01 Health and Safety Plan

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## **BETA COMMENTS:**

<u>Item</u>	<u>Action Code</u>	<u>Description/Comments</u>
1	5	<b>Health and Safety Plan</b> 1. Filed for Record

### Action Codes

- 1 - No Exception Taken
- 2 - Make Corrections Noted
- 3 - Amend and Resubmit
- 4 - Rejected, See Remarks

- a. Installation shall proceed only when Action Code is '1' or '2'.
- b. Submittals action coded '3' shall be resubmitted within time limit set in Contract.
- c. Review does not relieve Contractor from responsibility of compliance with the Contract Documents.



PROJECT: 9900. - Veolia/Taunton WWTF Phase 1 Improvements

DATE: 10/22/2021

SUBMITTAL: 01069-01 - Health and Safety Plan
REVISION: 0
STATUS: Eng
SPEC #: 11069

TO: Michael Andrus
Beta Group Inc.
6 Blackstone Place
Lincoln, RI 02865
MAndrus@BETA-Inc.com

FROM: Ryan Murphy
Hart Engineering Corporation
800 Scenic View Drive
Cumberland, RI 02864
rmurphy@hartcompanies.com

Table with 6 columns: Item, Revision, Description, Status, Date Sent, Date Returned. Includes a 'Notes:' row.

SHOP DRAWING REVIEW
1 - Approved, 2 - Approved as Noted, 3 - Revise and Resubmit, 4 - Rejected, 5 - Record File Only - No Action Taken
IMPORTANT NOTE FOR CONTRACTOR
Review is only for general compliance with the design concept and information provided in Contract Documents.
BETA GROUP, INC. Checked By: MLA
By: MLA Date: 11/4/21

Additional Notes:

Status Codes

- 1-APP - No Exceptions Taken
2-ANR - Make Corrections Noted
3-R&R - Revise and Resubmit
4-REJ - Rejected
5-IPO - For Information Purposes Only
6-NRR - Not Required for Review
ENG - Submitted to Engineer

Sincerely,
Hart Engineering Corporation

DATE: 10/22/2021



**HART ENGINEERING**

# **9900 Taunton WWTP Phase One**

## **Site Specific Health & Safety Plan**

**October 2021**

**HEC #9700**

**Taunton WWTP Phase One**



# Project Contacts List And Emergency Services

## 9900 Taunton WWTP Phase One

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### Project Team

Site Superintendent  
Brian Little  
401-302-0092

Project Manager  
Ryan Murphy  
774-218-6296

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### LOCAL EMERGENCY SERVICES - FIRE & POLICE      DIAL 911

Non-Emergency/Dispatch #: Police: Taunton Police Dept  
25 Summer St Taunton, MA 02142  
Phone: 508-824-7522

Fire: Taunton Fire Department  
50 School St Taunton, MA  
Phone: 508-821-1452

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## NEW HIRE ORIENTATION REVIEW AND CHECKLIST

Orientation stresses safety as a matter of common sense and attitude. It also serves to address the concept of teamwork, communication, and self-discipline. Further, it makes the foreman, supervisors, as well as the craftsmen, all aware of their responsibilities concerning workplace safety. Site-specific information provides an overview of the regulating expectations including those of Hart Engineering Corporation and our Client.

*“Working Safely Is A Condition Of Employment For Everyone With HART COMPANIES.”*

### A. RESPONSIBILITIES

Each supervisor is to ensure that all employees under his/her direction and care have received an initial site-specific safety orientation, before they begin of any work.

Each team member is committed to perform their work in a safe professional manner, consistent with the performance requirements established by HART, the Client and those of any established authority having jurisdiction at the worksite.

### B. OUTLINE

**Parking, Smoking, Sanitary Facilities:** Use only those areas and/or facilities specifically designated for use by our team members at this worksite. Personal property may be left in place prepared for team use. Please secure your valuables as necessary.

**Personal Protective Equipment:** Selection, use, care and maintenance of personal protective and life saving equipment. Minimum requirements for work on-site include:

- 100% Head, Eye, Hand, and Foot protection (leather work boots),
- Hard hats must be worn with the bill facing forward, as intended by the manufacturer,
- Long trousers appropriate to construction work (i.e., jeans). Sweat pants are not permitted.
- Shirts must have at least a 4” sleeve. Rolling of sleeves to a shorter length is not permitted.
- Clothing (incl. headwear) must be without any inappropriate language or artwork.

**Hazard Communication (HAZCOM):** This section of the safety orientation stresses the importance of knowing about the chemicals and other hazardous substances that may be generated or encountered within the project worksite, understanding where to find the Safety Data Sheets and information necessary related to exposure prevention.

**Personal Tools:** All team members must perform an inspection of their tools on a daily basis. All tools must be of safe design and construction for the work to be performed.

**Housekeeping:** Keep the worksite clean and safe. Use the proper containers provided for the collection/separation of waste trash, oily/used rags and other wastes.

**Fire Protection and Prevention:** Fire prevention and protection starts with everyone. Know what to do in case of fire, how to call for help and how alarms/extinguishers work.

**Hand and Power Tools:** Safe use of hand tools, electrically powered tools, powder-actuated tools, and other tools is required. Inspect tools before use to make sure they have been maintained, are guarded, and use required personal protective equipment.

**Electrical:** Team members need to be protected from electrical hazards with the use of Lock-Out/Tag-Out of circuits, Ground Fault Protection, grounding and bonding, equipment installation, maintenance, and temporary wiring/lighting.

**Ladders:** Properly use all ladders to appropriately access your work. Select the correct ladder for the task, and inspect it prior to use to ensure a safe work condition. Know the limitations of and properly set-up/use the different ladders. Metal ladders are prohibited. The use of Platform/Podium Stepladders is preferred, with the traditional 'A'-Frame stepladder being phased out of HART Companies worksites.

**Scaffolds:** Only use scaffolding and stair-towers that have been properly constructed by a trained scaffold erector. Know the structure's weight limitations and make sure it has been inspected before use. Scaffolds and stair-towers are fitted with colored tags to help you readily understand use restrictions. Red tagged scaffolds may not be used. Yellow tagged scaffolds may only be used with additional fall protection equipment. Only green tagged scaffolds may be freely accessed for regular work.

**Fall Protection:** The safeguarding of team members that work in elevated locations is critical. Know how to use guardrails, covers, personal fall arrest systems, and lifelines, lanyards. Floor and wall openings, steel erection, decking, floor loading and similar work require additional protective measures for the team member and others near them. *All work at six feet or greater requires Fall Protection to guard personnel against injury/risk.*

**Excavations:** General/specific protection requirements are topics. Passageways, personal protective equipment, and vehicular traffic are discussed. Also covered are barricades, trenching requirement, and entry.

**Vehicle/Equipment Safety:** Mobile equipment are great assets and must be operated safely. They are only to be used by trained personnel and inspected before use. Inspections as required by the manufacturer. Speeds limited to 10 mph (max) on the worksite.

**Permits:** Certain types of work will require the use of permits. Permit work includes 'Hot Work', Excavations, and Confined Spaces. Know when, why and how they must be used.

**Specialized Training:** Some of our work will require training or refresher/recertification programs, such as Hazard Communications or Forklift use, to help our team members to effectively eliminate/control hazards or other exposures to illness or injury.

**Jobsite Meetings:** Jobsite meetings are all about communication, protection of team members and the prevention of accidents. ATTENDANCE IS MANDATORY.

**Job Hazard Analyses:** To better protect ourselves against harm, it is important that team members understand the hazards related to their work and how to eliminate them. JHA's are developed and provided by HART and its sub-contractors for your safety. Please read them before you begin your work, and be alert for any changes.

**First Aid/Emergency Treatment:** First aid services are available to team members on all HART projects. Know the locations of first aid supplies and what to do in an emergency. *Report All Incidents, Accidents, Injuries and Near-Misses Immediately!*

**Safety Incentive Award:** Safe work with HART Companies is required – and also rewarded. Your worksite supervisor will tell you about the program at your worksite.

**Disciplinary Procedures:** Personal conduct and safe work requirements must be followed. Infractions or violations of our policies are subject to disciplinary action that may include removal from the worksite.

"I have reviewed the above with the worksite Supervisor and understand what is required of me to work with HART Companies. I also know that I may ask the Supervisor questions at any time in the event that I do not recall or am confused by any details regarding my ability to work safely."

---

(Employee, Print Name)

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(Employee Signature)

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(Date)

---

(Supervisor, Print)

# **SECTION 10**

# **HOUSEKEEPING**



**HOUSEKEEPING**

This procedure is designed to give Supervisors and employees guidance in maintaining clear work areas, working and walking surfaces in order to provide a work site that presents a minimum amount of risk to personnel under any conditions, and encourage safe work habits.

**General:**

In general, all trash, waste, and scrap must be placed in properly located trash receptacles. Traffic routes leading to and from all work locations must be effectively illuminated and clear of obstructions and debris.

- Keep tools and working materials in proper containers.
- Store trash, waste, scrap and packaging in proper containers.
- Remove from the worksite daily.
- Store materials safely.
- Put cigarette stubs in butt cans located in the designated areas.
- Keep small items in boxes or bins.
- Keep floors clear of tools, rod ends, metal shavings and general scrap.
- Keep walkways and working surfaces clear of obstructions and debris.
- Ensure that worktables are occupied only by work at hand and the tools required for the work being done.
- Do not leave aerosol cans on lab tables.
- Properly store or contain combustible material to minimize the risk of fire.
- Clean up tools and work areas as your project progresses.
- Keep cords and hoses 7 feet overhead when possible, or lay them flat and out of walkways.
- Floor located utility cords and hoses must be protected from traffic damage and other hazards.
- Keep floors and walkways clear of unused electrical cords.
- Keep all material, tools and equipment in a stable position (tied, stacked or chocked) to prevent rolling or falling.
- Maintain clear access to all work areas.
- Keep stairways clear of debris.
- Contain and clean up liquid or other material spills immediately.

**Safe Access:**

- Walking surfaces, (walkways and stairways) must be clear at all times.
- Ladders access must not be blocked.
- Emergency exits must be clearly identified and clear of all materials/debris.
- Access to any and all emergency equipment, fire extinguishers, alarm stations, electrical panels and/or electrical disconnect switch/boxes must be free of all obstructions.

- Stack, interlock, store, or spot material so that it cannot fall or present other hazards to workers, and be accessed readily by personnel and material-handling equipment.
- Maintain all guardrails and barricades.

- End Of Section -

## LOCK CUTTING / REMOVAL Authorization Form

### ATTACHMENT B

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

Lock Owner's Name: \_\_\_\_\_

Lock Owner's Company: \_\_\_\_\_ Trade: \_\_\_\_\_

Badge Number: \_\_\_\_\_ Lock Number \_\_\_\_\_

Employee Requesting Removal \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Alternatives Considered \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Attempted to contact Lock Owner by phone:

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Attempt By: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Attempt By: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Attempt By: \_\_\_\_\_

Safety Manager \_\_\_\_\_ Site Manager \_\_\_\_\_

Lock Owner's Foreman \_\_\_\_\_

Lock Owner's Supt/Mgr \_\_\_\_\_

Time Keeper / Security \_\_\_\_\_

Lock Owner Upon Return \_\_\_\_\_

**- To Be Completed Prior To The Removal of Each Lock Securing Hazardous Energy Sources/Equipment -**

## HAZARDOUS ENERGY CONTROL SURVEY

### ATTACHMENT C

Project \_\_\_\_\_ Date \_\_\_\_\_

Crew Coordinator \_\_\_\_\_ Hazardous Energy Control Coordinator \_\_\_\_\_

Equipment Description \_\_\_\_\_

Purpose for Isolation \_\_\_\_\_

Hazardous Energy Source	Volts	Pressure	Temperature	Other

### Method of Isolation

Electrical Disconnect Isolation Spool      Blind Flange Double Valve & Vent      Slip Blind Open Flange      Disconnected Service Component Disconnect

Isolation Device & Location	Lock No.	Date Installed	Date Removed

Zero Energy verified by \_\_\_\_\_ Method \_\_\_\_\_

### Employees Protected by Lock-Out

Name	Badge No.	In

Name	Badge No.	Out

**ELECTRICALLY HAZARDOUS TASK - REQUEST FOR SHUTDOWN**  
**ATTACHMENT D**

Site: \_\_\_\_\_ Area: \_\_\_\_\_ Project: \_\_\_\_\_

Planned start date: \_\_\_\_\_ Time: \_\_\_\_\_ Duration: \_\_\_\_\_

Description of work to be done: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

The following is requested to be shut down: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

1.) Until work is complete \_\_\_\_\_

2.) Temporarily while barriers are being placed \_\_\_\_\_

Requested by: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

(To be completed by facility owner)

When is the next available date for shutdown? \_\_\_\_\_

The above requested equipment shutdown:

1.) Will be performed \_\_\_\_\_ 2.) Will not be performed \_\_\_\_\_

If shutdown is denied, give reason(s) for denial satisfying the requirements under the OSHA and NFPA 70E regulations:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Client/CM/Facility signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date \_\_\_\_\_

HART Project Manager: \_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_

## HAZARDOUS TASK EXPOSURE - REQUEST FOR SHUTDOWN

### ATTACHMENT E

Site: \_\_\_\_\_ Area: \_\_\_\_\_ Project: \_\_\_\_\_

Planned start date: \_\_\_\_\_ Time: \_\_\_\_\_ Duration: \_\_\_\_\_

Description of work to be done: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

The following is requested to be shut down: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

1.) Until work is complete \_\_\_\_\_

2.) Temporarily while barriers are being placed \_\_\_\_\_

Requested by: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

(To be completed by facility owner)

When is the next available date for shutdown? \_\_\_\_\_

The above requested equipment shutdown:

1.) Will be performed \_\_\_\_\_ 2.) Will not be performed \_\_\_\_\_

If shutdown is denied, give reason(s) for denial satisfying the requirements under the OSHA, NFPA 70E and any other applicable regulations (specify as necessary):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Client/CM/Facility signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date \_\_\_\_\_

HART Project Manager: \_\_\_\_\_ Date \_\_\_\_\_

**SECTION 11**

**ELECTRICAL SAFETY,  
HAZARDOUS ENERGY CONTROL,  
ASSURED GROUNDING**



## **HAZARDOUS ENERGY CONTROL PROCEDURE**

This procedure establishes the minimum requirements for the isolation of hazardous energy sources to

ensure the safety and health of employees where unexpected startup or release of stored or residual energy could cause injury. The following principles must apply to energy isolation tasks to ensure an appropriate level of safety and compliance with Safety Standards.

## **REQUIREMENTS**

This procedure is applicable to all HART and subcontractor employees.

Supervision is responsible for ensuring employees follow all aspects of this procedure.

Employees are responsible for following all requirements outlined in this procedure.

Subcontractors are responsible for following all requirements outlined in this procedure.

### **Purpose**

To ensure the safety of personnel by establishing appropriate HART/tag-out (LOTO) procedures for isolation of equipment which is capable of storing hazardous energy, including but not limited to: electrical, chemical, mechanical, hydraulic, pneumatic, kinetic, and thermal.

### **Scope**

To provide specific standard procedures controlling methods for rendering inactive any electrical equipment or other operating system that could potentially release energy and cause injury when equipment is down for any reason such as repair, removal, replacement or installation of new equipment.

### **Procedures**

Use danger tags and locks only to prohibit operation of a valve, switch, or piece of equipment when injury or damage to property could result from the operation. No work is to be performed on operable equipment until the equipment is de-energized by using this procedure. Additionally, Lock-Out is required if the work being done requires an employee to place any part of their body into an area where a danger zone exists.

### **Note:**

**Lock-Out is required regardless of the number of interlocks or the complexity of software controls. Lock-Out is required if a safety device such as interlocks, guards, covers, or doors are removed /opened / bypassed, exposing a danger zone.**

## **A. DEFINITIONS**

### Affected Employee

An employee whose job requires him/her to work in, or enter into the proximity of, an area where maintenance, inspection, and/or construction work is being performed under the provisions of this Hazardous Energy Control Procedure.

Authorized Employee

Any employee who performs any work, or participates in a hazardous energy Lock-Out / Tag-Out, under the provisions of this Hazardous Energy Control Procedure.

Coordination Supervisor

A supervisor that has been assigned the responsibility for a Lock-Out process with the authority to de-energize and/or isolate equipment, circuits and systems. This supervisor will be responsible for reviewing the Hazardous Energy Control Survey (Attachment A) and ensuring that all hazardous energy isolation devices have been identified, isolated and locked out.

Crew Coordinator

A single authorized individual who shall, on behalf of him/her self and his/her entire work crew, faithfully execute the requirements of this Hazardous Energy Control Procedure.

Hazardous Energy

Any source of Chemical, Mechanical, Electrical, Thermal, Pneumatic, Electromagnetic, Nuclear, or other energy of a sufficient magnitude to produce personal injury or illness.

Lock-Out

The placement of a Lock-Out device on an energy-isolating device in accordance with this Hazardous Energy Control Procedure thereby ensuring that the energy isolating device and the equipment being controlled cannot be operated or the energy released.

Lock-Out Box

A key controlled metal box painted white and stenciled "Lock-Out Box" with multiple hasps used for securing a complex, Lock-Out system that requires individual locks for a number of employees.

Lock-Out Device

A mechanical device to be used solely in the performance of a Lock-Out, such as a vinyl coated steel cable or chain, used in conjunction with a keyed padlock.

**B. TRAINING**

- a) Employees shall receive Hazardous Energy Control training as part of their Company's New Hire Orientation and annually thereafter.
- b) Retraining shall be provided if there is a change in job assignments, in machines, a change in the energy control procedures or a new hazard introduced or as part of reinforcing an employees skills as part of a progressive disciplinary action.
- c) All training or retraining must be documented and signed by the employee and instructor.
- d) All affected employees are to be instructed in the purpose and use of the energy control procedure.
- e) Employees shall receive training in the recognition of hazardous energy source, type and magnitude of energy available, methods and means necessary for energy isolation and

control. The training shall include tagging requirements, limitations and employee roles and responsibilities.

## C. GENERAL

### 1. LOCKS

- a) Only individually keyed padlocks shall be used. Padlocks are to be numbered and color-coded for easier detection and identification.
- b) Lock-Out locks are only to be used for the intended purpose.
- c) A Lock-Out device of the standard scissors type that will allow the placing of more than one padlock is required.
- d) A piece of chain or cable may be necessary to complete a Lock-Out on some valves or controls and shall be used wherever needed.
- e) When voltage exceeds 600 volts, components must be grounded.

## D. LOCK CUTTING/REMOVAL

In the event it becomes necessary to remove an employee's lock, due to his/her absence from the project with a family emergency, or sudden illness, the LOCK CUTTING/REMOVAL procedure shall be strictly adhered to and the LOCK CUTTING/REMOVAL form completed with all mandatory signatures acquired.

### To Initiate:

- 1) The employee's immediate supervisor is to be contacted and informed as to the reason for the request.
- 2) Alternatives are to be considered, for example, rescheduling the work. If an alternative can be utilized it should. If not, the individual requesting the removal of the lock and the lock owner's foreman shall contact the project Safety Manager.
- 3) The Safety Manager, with those mentioned above, shall contact the project Site Manager and inform him of the request. After authorization is granted from the Site Manager all sections of the Lock Cutting Removal Form (Attachment B) shall be completed. This form lists:
  - 4) Lock owners name, badge number, and lock number.
  - 5) Name of person requesting removal.
  - 6) Reason for request and alternatives considered.
  - 7) Attempt to contact lock owner by phone; Date and time.
  - 8) Authorizing signatures.
  - 9) A copy of the completed form is to be hand delivered to the time office. The lock owner

will be denied access to the project until such time he/she retrieves the form and signs off acknowledging the lock removal. The lock owner shall return the form to the Safety Manager.

- 10) The Safety Manager is to attach the copy to the original. The original is to be filed and maintained by the safety department.
- 11) Contact lock owner prior to start of shift during next workday.

**E.** The following describes storage and issuance of Lock-Out locks by HART's Project Manager;

**When so required**, each department/trade will have a color of Lock-Out lock as outlined below.

Mechanical	Red
Electrical	Yellow
Civil	Blue
Safety	Green

Each department will provide and maintain an individual Lock-Out station consisting of their respective colored Lock-Out locks, as listed above, and a bound Lock-Out Logbook. The HART Safety Department will maintain a small supply of Lock-Out locks for its own use. These locks will be used by the safety department during safety inspections of systems under Lock-Out. The following information will be necessary with each Lock-Out lock issued.

1. Name of Superintendent
2. Lock number issued
3. Date issued
4. Location of lock issued

### **Equipment Start Up / Shut Down**

#### **General**

1. Use only standard approved "Danger Do Not Operate" tags.
2. Tags will be filled out in the spaces provided and include employee name, company name and contact number.
3. Tags will never be re-used, but destroyed immediately upon removal. No alterations are permitted. (Unless tags are specifically made for reuse.)
4. No device will be operated with tag or lock attached regardless of circumstances.
5. No person will remove another's lock or tag without following the lock cutting removal procedure outlined in this section.
6. It is the craft superintendent's responsibility to ensure that no work is performed without the required 'hazardous energy control' protection locks and tags installed.
7. Locks and tags are not a substitute for Owner's responsibility for breaking flanges, placing blanks, draining, and otherwise decontaminating equipment or systems under their control.

8. The HART Project Superintendent and Sub-Contractor Superintendent will maintain a lock numbering system in a bound logbook listing lock locations. Each lock and tag will be numbered and logged for each use. After use, the lock will be returned for subsequent reissue. The tag will be destroyed (unless designated for re-use).
  9. In instances where crafts other than Electrical and Mechanical request Lock-Out of Electrical and Mechanical systems, the HART Superintendent and the Supervisor of the contractor requesting the Lock-Out will be responsible for coordinating the Lock-Out.
  10. In instances where Lock-Out will be requested on systems with both electrical and mechanical components the Superintendent of the contractor requesting the Lock-Out will be responsible for coordination of system walk downs and the Lock-Out.'
  11. Contractor craft locks and tags required beyond one shift will be replaced by the oncoming shift.
    - a) The manufacturer and or established start up or shut down procedures are to be followed to avoid any additional or increased hazard(s) to employees or equipment as a result of equipment start up or shut down.
    - b) The applicable equipment start up or shut down procedure is to be included as part of the employee(s) Safety Task Assignment for the task to be performed.
1. Electrically-Operated Systems
- A. The system owner will be responsible for de-energizing, placing of a multi-Lock-Out device, lock, tag and trying all Electrically Operated Systems under their ownership. If the system is owned by construction the Superintendent in conjunction with the Contractor Superintendent will be responsible for de-energization and isolation of the equipment.
  - B. The HART Project Superintendent along with the Electrical Contractor's Superintendent will physically verify' the electrically operated system has been correctly isolated. This will include attempting to operate the isolated equipment to ensure that it is not supplied with power from another source and will not function as a result of stored mechanical and/or potential energy.
  - C. Upon verification the HART Superintendent will place his HART lock and tag onto the multi-Lock-Out device. The Electrical Contractor Superintendent will then place his HART lock and tag onto the multi-Lock-Out device.
  - D. All HART Project Superintendents and Contractor Superintendents of crafts other than electrical involved in the Lock-Out of the electrically operated system will place their Lock-Out lock and tag on to the multi-Lock-Out device.
- From this-step-forward the contractor superintendent may be from any craft.**
- E. The Contractor Superintendent will place the key(s) from their Lock-Out locks into a lockbox located in the contractor's work area. The Contractor Superintendent will then place an additional Lock-Out lock and tag onto the lockbox to prevent the unwanted removal of the keys from the Lock-Out box. This box will be referred to as

the “contractor Lock-Out box”.

**NOTE:**

**There will be a separate “contractor Lock-Out box” for every prime contractor company performing work within the system under Lock-Out. Subcontractors of the prime contractor may Lock-Out on the prime contractor’s Lock-Out box.**

- F. The Contractor Superintendent will explain to all craft employees performing work under his/her supervision within the locked out system the details of the Lock-Out performed by the owner of the system.
- G. The Contractor Superintendent, accompanied by all craft employees performing work under his/her supervision within the locked out system will verify that the electrically operated system has been correctly isolated.
- H. Upon verification of the Lock-Out, all craft employees will place their individual Lock-Out lock and tag onto the contractor Lock-Out box. Multi-Lock-Out devices will be added as needed to accommodate for the number of employees required to place a Lock-Out lock and tag onto the contractor HART box.
- I. Personnel from crafts other than electrical requesting to Lock-Out electrically operated systems must contact their respective HART Superintendent/Foremen. The HART Project Superintendent will be responsible for coordinating all Lock-Out’s.
- J. The ‘New Construction’ Electrical Lock-Out sequence (below) is to be followed when working within facilities under construction and under the direct control of HART Engineering:
  - Electrical contractor de-energizing the system (Electrical Superintendent)
  - Client’s designated construction representative (as may be required)
  - HART Project Superintendent
  
  - Trade Contractor Superintendent (Other than electrical)
  - All craft employees performing work at specified contractor lock boxes
  - The lock sequence will be reversed for the removal of HART lock(s) and tag(s).

**If the owner wishes the contractor lockbox opened for the removal of the key(s) for any reason, steps A-G of this procedure MUST be repeated prior to the re-commencement of work.**

**2. Mechanically-Operated Systems**

- A. The system owner will be responsible for de-energizing, placing of a multi-Lock-Out device, lock, tag and trying all Mechanically Operated Systems under their ownership. If the system is owned by construction the Superintendent in conjunction with the Contractor Superintendent will be responsible for the de-energizing and isolation of the equipment.

- B. The HART Project Superintendent along with the Mechanical Contractor's Superintendent will physically verify the mechanically operated system has been correctly isolated. This will include attempting to operate the isolated equipment to ensure that it is not supplied with power from another source and will not function as a result of stored mechanical and/or potential energy.
- C. Upon verification the HART Superintendent will place his HART lock and tag onto the multi-Lock-Out device. The Mechanical Contractor Superintendent will then place his HART lock and tag onto the multi-Lock-Out device.
- D. All HART Project Superintendents and Contractor Superintendents of crafts other than mechanical involved in the Lock-Out of the mechanically operated system will place their Lock-Out lock and tag on to the multi-Lock-Out device.

**From this-step-forward the contractor superintendent may be from any craft.**

- E. The Contractor Superintendent will explain to all craft employees performing work under his/her supervision within the locked out system the details of the Lock-Out performed by the owner of the system.
- F. The Contractor Superintendent, accompanied by all craft employees performing work under his/her supervision within the locked out system will verify that the mechanically operated system has been correctly isolated.
- G. Upon verification of the Lock-Out, all craft employees will place their individual Lock-Out lock and tag onto the contractor Lock-Out box. Multi-Lock-Out devices will be added as needed to accommodate for the number of employees required to place a Lock-Out lock and tag onto the contractor HART box.
- H. Personnel from crafts other than mechanical requesting to Lock-Out mechanically operated systems must contact their respective HART Superintendent. The HART Project Superintendent will be responsible for coordinating all Lock-Out's.
- I. The 'New Construction' Mechanical Lock-Out sequence (below) is to be followed when working within facilities under construction and under the direct control of HART Engineering:
  - Mechanical contractor isolating the system (Mechanical Superintendent)
  - Client's designated construction representative (as may be required)
  - HART Mechanical Superintendent
  - Contractor Superintended (Other than mechanical)
  - All craft employees at individual contractor lock boxes.
  - The lock sequence will be reversed for the removal of HART lock(s) and tag(s).

**Note:**

**When the Client/GC/CM wishes the contractor lockbox opened for the removal of the key(s) for any reason, steps A-G of this procedure MUST be repeated prior to the resumption of any work.**

3. Client or General Contractor Controlled Systems (any)

- A. The Clients Responsible System Owner (RSO) will be responsible for initiating the



de-energizing of systems or components, installation of a multi-Lock-Out device, Client lock, tag and testing all related Energy/Stored Energy Systems under their ownership, confirming that all stored energy has been bled/expended. When the system is co-owned by construction the HART Project Superintendent in conjunction with the related Trades Contractor Superintendent(s) will be responsible for the de-energizing and isolation of the equipment.

- B. The HART Project Superintendent along with the assistance of any related Trade Contractor(s)'s Superintendent(s) will further verify' the isolated equipment/system has been correctly de-energized. This will include attempting to operate the isolated equipment to ensure that it is not supplied with power from another source and will not function as a result of stored mechanical and/or potential energy.
- C. Upon verification of complete isolation, the HART Superintendent will place his HART lock and tag onto the Client's multi-Lock-Out device.
- D. All other involved HART and Trades Contractor Supervisors of crafts involved in the Lock-Out of the isolated operated system will place their Lock-Out lock and tag on to the multi-Lock-Out device.

**From this-step-forward the contractor superintendent may be from any craft.**

- E. The Cognizant Trades Contractor Supervisor (foremen) will explain, to all craft employees performing work under his/her supervision within the locked out system, the details of the Lock-Out performed by the owner of the system.
- F. The Trades Contractor Supervisors, accompanied by all craft employees performing work under his/her supervision within the locked out system will verify that the mechanically operated system has been correctly isolated.
- G. Upon verification of the Lock-Out, all craft employees will place their individual Lock-Out lock and tag onto the contractor Lock-Out box. Multi-Lock-Out devices will be added as needed to accommodate for the number of employees required to place a Lock-Out lock and tag onto the contractor HART box.
- H. Personnel from all trades crafts requesting a Lock-Out of any Client controlled systems must contact their respective HART supervisor. The HART Project Superintendent will be responsible for coordinating all Lock-Out's.
- I. The alternate lock sequence below is to be as followed when working within operating facilities or 'turned-over' systems that are under the direct control of the Client or General/Controlling Contractor:
  - Client's/GC's/CM's designated workforce personnel de-energizing the system
  - HART Project Superintendent
  - Trade Prime Contractor Superintendent
  - Electrical/Mechanical/System/Component contractor foremen performing work
  - All craft employees performing work at specified contractor lock boxes
  - The alternate lock sequence in this subsection will be reversed for the removal of subcontractor and HART lock(s) and tag(s) from Client controlled facility

systems.

**Note:**

**When the Client/GC/CM wishes the contractor lockbox opened for the removal of the key(s) for any reason, steps A-G of this procedure MUST be repeated prior to the resumption of any work.**

ATTACHMENT A: Lock-Out/Tag-Out Log

ATTACHMENT B: Lock Cutting Authorization Form

ATTACHMENT C: Hazardous Energy Control Survey

ATTACHMENT D: Hazardous Task - Electrical Shut-Down Request Form

ATTACHMENT E: Hazardous Task – Shut-Down Request Form (Non-Electrical)

## **ASSURED GROUNDING PROGRAM**

This section provides the standard method for implementing and maintaining an OSHA Assured Equipment Grounding Conductor (AEGC) program.

### **A. SCOPE**

This procedure outlines specific electrical inspection procedures and the frequency of inspection for electrical tools and electrical equipment.

This procedure does not supersede the requirements to visually inspect all hand tools before and after each use

### **B. RESPONSIBILITIES**

The Subcontractor foremen shall maintain a record of all electrical equipment on the site. All electrical tools arriving onsite must be inspected per this procedure prior to use on this site. The tools and equipment must be re-inspected periodically as outlined below.

Contractors shall inspect construction electrical tools and electrical equipment as outlined in this procedure and shall keep records of all inspections and repairs performed throughout duration of project.

Only qualified personnel shall repair the electrical components of construction electrical tools and electrical equipment.

### C. PROCEDURES

Electrical tools or electrical equipment are not to be issued for use until inspected. Electrical tools and electrical equipment determined by inspection to be in need of repair are to be tagged “defective” until repaired. Following repair, the tool or equipment must be inspected before it can be used in the field. Under no circumstances may tools or equipment in need of inspection or repair remain in service.

Each craft shall ensure that electrical tools and equipment it has, or is using, bear the current inspection tape. Before using any electrical tools and equipment, the crafts person shall visually inspect such equipment for defects. If any defect is found or the equipment does not bear a current inspection sticker, the equipment shall be returned for inspection.

“Defective” electrical tools and equipment are to be tagged and removed from service until repaired and inspected. Repaired electrical tools and equipment are to be re-inspected and re-tested prior to their return to service/use.

GFCI devices must be used whenever electrical cord-sets or electrically corded equipment is connected to any power source, unless that source has been confirmed as being GFCI protected at the circuit’s breaker panel. GFCI devices must be directly connected to the source of electrical power. GFCI devices must be tested prior to use.

### D. INSPECTION/MARKING SYSTEM

The frequency for periodic inspection of construction electrical tools and electrical equipment shall be indicated by attached color-coded tape. The crafts person using the tools and equipment shall ensure that the markings remain on between inspections. The color codes and their corresponding scheduled inspection dates are:

<b>Month</b>	<b>Color Code</b>	<b>Month</b>	<b>Color Code</b>
January	White	July	Red
February	Green	August	Orange
March	Red	September	White
April	Orange	October	Green
May	White	November	Red
June	Green	December	Orange

Color-coded tape or shall be placed approximately six (6”) from the connectors on the electrical cord and at the top of the receptacle.

Electrical wiring tie-wraps may not be substituted for tape.

**NOTE: ELECTRICAL TOOLS, EXTENSION CORDS, ETC. ARE NOT TO BE ISSUED OR USED WITHOUT PROPER COLOR CODE.**

### E. MONTHLY INSPECTIONS

Portable electrical hand tools, all portable electrical equipment, cord sets and adapters shall be inspected monthly using an approved tester in conjunction with a visual inspection. For example:

- Model B-2500 tester made by Pow-R-Safe division of Multi-Amp Corporation, 4271 Bronze Way, Dallas, TX 75237
- Model 1020 ECOS electrical safety analyzer made by ECOS Electronics Corporation, 205 West Harrison Street, Oak park, IL 60304
- As a minimum, the visual inspection must include the following:
  - Checking the cord for worn or cracked insulation.
  - Checking the cord entry to plug and tool housing for frayed or worn insulation and strain relief.
  - Checking the plug prongs for damage.
- Checking the plug for exposed connectors
- Checking the equipment housing for damage.
- Checking trigger locks to ensure they have been removed.

Voltage testers or measurement devices shall be inspected quarterly. The electrical test for inspecting voltage testers or measurement devices should include test live AC and DC voltage. Personal protective equipment shall be worn while testing.

As a minimum, the visual inspection shall include:

- Checking the leads for signs of wear, poor connections at probes, etc.
- Checking the housing and the readout window for cracks, loose screws, etc.

## **F. DOUBLE-INSULATED TOOLS**

Double-insulated, portable hand tools may be used provided they bear the Underwriters Laboratories' "Double-Insulated" label and are of heavy-duty construction.

Double-insulated tools shall be inspected on monthly. The inspection shall include the visual inspection as already outlined as well as the following electrical tests:

A Multi-Amp test, accomplished by connecting two leads on any clean metal points on the equipment housing .one lead into the black receptacle on the test set (simulating the third wire), the other lead into the white receptacle (which is the same as the grounding cradle on the tester). The presence of leakage current (caused by carbon or moisture paths, or insulation breakdown) is indicated as a "power ground." Also during this same test, a line-to-line short circuit anywhere in the equipment, line cord, or switch will be indicated as a "short circuit."

After completing the Multi-Amp tests, verify that the GFI works properly using a Hubbell GFT (or similar device). Remove the Hubbell GFT-2F and plug in the double-insulated tool. If the GFI trips with the tool running, the tool is defective and shall be repaired or replaced.

## **G. SEMI-ANNUAL INSPECTIONS**

Permanently wired shop equipment shall be inspected semi-annually. Inspection should

include the following items:

- Checking for proper overload protection.
- Checking mechanical operations of the switch.
- Checking continuity of ground.
- Checking limit switches.
- Checking interlocks.
- Checking for frayed cords.
- Checking for broken plugs and outlets/sockets.
- Checking flexible conduit and connectors.
- Office equipment shall also be inspected semi-annually.

As use of certain test instruments can damage electronic components in computers and similar office equipment, visual inspection is all that is necessary for the type of office equipment.

## **WORKING ON OR NEAR EXPOSED ENERGIZED ELECTRICAL CIRCUITS / EQUIPMENT**

### **SCOPE**

All live electrical parts in excess of 50 volts ac to ground or 100 volts dc positive (+) to negative (-), to which an employee may be exposed shall be de-energized and locked out before the employee works on or near them, unless it is demonstrated that de-energizing them introduces additional or increased hazards or is not feasible due to equipment design or operational limitations.

Examples of increased or additional hazards include interruption of life support equipment, deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, removal of illumination for an area.

Examples of work that may be performed on or near energized circuit parts because of unfeasibility due to equipment design or operational limitations include testing of electric circuits that can only be performed with the circuit energized, work on circuits that form an integral part of a continuous industrial process in a chemical plant that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment.

### **A. DEFINITIONS**

#### Electrically Hazardous Task

A task involving electrical equipment energized above 50 volts ac to ground or 100 volts dc positive (+) to negative (-).

#### High-Level Energy

A condition that exposes or potentially exposes workers to flash burns. All tasks on electrical distribution equipment operating at voltages greater than 600 volts are classified as high-level energy. Other high-level energy tasks are those on or within substations, motor control centers and bus ducts, QMB-type panels fed directly from substations, other equipment fed directly from substations, and other equipment so defined.

#### High-Level Voltage

A condition that exposes or potentially exposes workers to shock from voltage greater than 125 volts, ac or dc.

#### Hot Work

A task involving intentional contact of body parts or tools with uninsulated energized components.

#### Insulating Barrier

An object that provides physical separation and electrical insulation between the energized components and the person performing the task, or that provides physical protection of the equipment from the work activity.

#### Lead Engineer

The most senior electrical engineer.

#### Other Hazardous Work

Work in which additional safeguards are required to limit employee exposure to electrical shock, arc flash burns, or arc blasts. For example, when an employee is exposed to an electrical shock, a task is normally classified as other hazardous work when it meets all of the following criteria:

1. the task is performed any distance above or within reach of uninsulated, energized conductors, terminals, or components; or within an enclosure containing these components;
2. contact with energized components is possible; and
3. the approach distances are equal to or greater than the minimum distances shown.

#### Proximity Work

Work in which approach distances, while performing the task, are less than the minimum safe approach distances.

#### Technical Review

For the purposes of this procedure, the safety manager's analysis of the specific written job plan to verify that the plan is adequate to accomplish the job safely.

#### Voltage

Electromotive force or potential difference expressed in volts. For the purposes of this procedure, voltage reference for ac is phase to ground and for dc is positive ( $\pm$ ) to negative (-).

#### Voltage Testing

A task solely intended to measure or sense voltage.

## B. GENERAL

### 1. Electrically Hazardous Tasks

Tasks involving electrical equipment energized above **50** volts ac to ground or 100 volts dc positive ( $\pm$ ) to negative (**-**) are classified as electrically hazardous.

The four types of hazards associated with work on or near energized uninsulated electrical equipment are the following:

- shock and burn due to contact
- electrical flash burn from arcs
- blast injury resulting from electrical faults
- upset or shutdown of an operating process

Electrically hazardous tasks are subdivided into four classes:

- hot work
- voltage testing
- proximity work
- other hazardous work.

### 2. Electrically Non-hazardous Tasks

Live parts that operate at less than 50 volts to ground need not be de-energized if there will be no increased exposure to electrical burns or to electrical explosion due to electric arc. At these low voltages, work on or near energized components may be performed without concern for electrocution. However, at low voltages, shock may cause a jerk reaction and appropriate precautions should be taken if the task involves any moving machinery parts, other hazardous objects, or fall hazards. Additionally, shorting or grounding of low-voltage circuits may result in equipment damage, process upset, or shutdown. Electrically, nonhazardous tasks must be carefully planned.

## C. REQUIREMENTS

**It is HART Companies' established policy that work will not be performed on live electrical circuits, by any individual involved in any HART supervised activity.**

There may be certain, rare, instances that may require work on live electrical systems. These instances are strictly limited to those circumstances that would cause harm or present significant danger to the general public. Alternate methods of providing power to affected activities that would otherwise lose energy due to an electrical shut-down must be reviewed prior to justifying 'Live Electrical Work.' The HART Project Manager shall evaluate the basis for performing the "Hot" work with circuits energized and document the justification for performing the "Hot" work in writing based on the criteria specified above. Attachment "A" is to be completed and signed by the HART Project Manager, HART Companies' Corporate Safety Director and the Principal of HART Engineering

Corporation before any 'Live Electrical Work' proceeds.

Convenience, or inconvenience, to project schedule, facility operation or other related non-emergency circumstances do not constitute situations justifying 'live electrical work', regardless of prior practices, professional qualifications and/or trades licenses.

Prior to performing any "Hot" work that has the potential to come in contact with live electrical parts, cables, lines, or equipment the Project Manager, Construction Manager, Electrical Superintendent, and Safety Representative shall be advised. Attachment "B" is to be completed and signed before any work proceeds.

All work on live electrical circuits shall be approved directly and on an individual basis by the Project Manager. Project Managers may not delegate the responsibility of approving live electrical work to HART subordinates or to subcontracted trades.

It is to be considered an extraordinary event anytime work is permitted on live electrical systems, circuits and/or components. THE PRIMARY MEANS OF PROTECTION IS TO DE-ENERGIZE THE CIRCUIT.

Under no circumstances shall any (one) person be permitted to perform 'Live Electrical' work alone.

#### **D. PROCEDURE**

Only recognized 'qualified' persons with the appropriate, documented, training and experience may work on specifically identified electrical circuits, components or other equipment that have not been de-energized. Such persons shall be capable of working safely on energized circuits and shall be knowledgeable of the governing Electrical Codes, OSHA *and* NFPA standards; NFPA 70 in particular. Understand the proper application of precautionary techniques. Qualified Electrical Workers shall understand, and be able to demonstrate in detail, the proper inspection, fit, use and care of related personal protective equipment, insulating and shielding materials and insulating tools.

HART's maintains the position that 'educational degrees', 'professional certifications' and 'professional licensing' do not automatically equate or correspond to any individual's classification as 'Qualified' to work on any hazardous live energy system.

Employees who face a risk of electrical shock but who are not qualified persons shall not be permitted to work on live electrical systems, should such circumstances, following a careful review that reveals that no other alternative is feasible, require such work.

Note: Reasons of project expense, economics, convenience and schedule are not to be considered as valid reasons to under which to conduct live electrical work.

#### **E. SAFE WORKING DISTANCE FROM ENERGIZED APPARATUS**

1. When work is to be done in the vicinity of energized apparatus, sufficient safe distance from such apparatus shall be maintained and suitable barriers erected or suitable rubber or other insulated protective devices used to prevent employees or materials from falling into or making contact with energized apparatus.



Energized electrical work above 240 volts requires a high voltage rescue hook.

2. When climbing above energized distribution circuits, the circuit to be climbed above shall be:

- de-energized, short circuited and grounded;
- covered with appropriate protective equipment; or
- moved out to a safe distance.

3. Employees shall not be permitted to approach or take any conductive object closer to exposed energized parts than shown below:

Voltage Range (Phase to Phase) Kilovolts	Minimum Working and Clear Hotstick Distance
1 or less	Avoid Contact
1.1 to 15	25 inches
15.1 to 36	28 inches
36.1 to 72.5	36 inches
138 to 145	43 inches

4. Qualified employees may work closer to energized apparatus than the instances shown above provided that:

- a. The employee is insulated or guarded from the energized part (appropriate rubber gloves and sleeves rated for the voltage involved shall be considered insulation for the employee from the energized part).
- b. The energized part is insulated or guarded from the employee and any other conductive object at a different potential.
- c. The employee is isolated, insulated or guarded from any other conductive object during live-line bare-hand work.
- d. For 345 kV, the minimum clearance distance may be reduced to the length of the line insulator, if a smaller clearance is needed to do the work.
- e. Precautions shall be taken while carrying conductive materials in close proximity to energized apparatus.

#### **F. PERSONAL PROTECTIVE EQUIPMENT**

1. Employees shall be provided with, and shall use, electrical protective equipment rated for the voltage involved and that is appropriate for the specific parts of the body to be protected for the work to be performed.
2. Protective equipment shall be selected in accordance with the applicable OSHA

and NFPA standards, stored and maintained in a safe, reliable condition. Electrical work PPE shall be periodically inspected and/or tested, as required by the Occupational Safety and Health Standards for General Industry 1910.137 and NFPA 70.

3. If the insulating capability of protective equipment may be subject to damage during use, the insulating material shall be protected i.e., an outer covering of leather is sometimes used for the protection of rubber insulating material.
4. Employees shall wear nonconductive head protection wherever there is a danger of head injury from electric shock or burns due to contact with exposed energized parts.
5. Employees shall wear protective equipment for the eyes, face, and body wherever there is danger of injury caused from electric arcs, flashes or from flying objects resulting from electrical explosions.
6. Employees shall use insulated tools or handling equipment. If the insulating capability of the insulated tool or handling equipment is subject to damage, the insulating material shall be protected.
7. Fuse handling equipment, insulated for the circuit voltage, shall be used to remove or install fuses when the fuse terminals are energized.
8. Ropes and handlines used near exposed energized parts shall be nonconductive.
9. Protective shields, barriers, or insulating materials rated for the voltage involved shall be used to protect each employee from shock, burns, or other electrically related injuries while the employee is working near exposed energized parts which might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they shall be guarded to protect employees from live parts.

## **G. ILLUMINATION**

1. Employees may not enter spaces containing exposed energized parts or work on exposed energized parts, unless adequate illumination is provided that enables the employees to perform the work safely.
4. Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts.
5. Employees may not reach blindly into areas that may contain energized parts.

## **H. CONDUCTIVE MATERIALS**

1. Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from

contacting exposed energized conductors or circuit parts.

2. Conductive articles of jewelry and clothing such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread or metal headgear may not be worn.

#### **I. CONFINED OR ENCLOSED WORK SPACES**

When any project-related employee works in a confined or enclosed space, such as a manhole or vault that contains exposed energized parts, the employee shall use protective shields, protective barricades, or insulating material as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

#### **J. ALERTING TECHNIQUES**

1. The following alerting techniques shall be used to warn and protect employees from hazards that could cause injury due to electric shock, burns, or failure of electric equipment parts.
2. Safety signs, safety symbols, or tags are to be used where necessary to warn employees about electrical hazards that may endanger them, as required by the Occupational Safety and Health Standards for General Industry 1910.145 and Construction (1926).
3. Nonconductive Barricades are to be used in conjunction with safety signs where it is necessary to prevent or limit employees access to work areas exposing employees to non-insulated energized conductors or circuit parts.
4. If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant shall be stationed to warn and protect employees.

#### **K. DISCONNECTING MEANS**

Each disconnecting means for de-energizing the energized circuit shall be identified and included as part of the employees STA.

#### **L. TEST EQUIPMENT**

1. Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.
2. Test instruments and equipment and all associated leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be

removed from service, and no employee may use it until repairs and test necessary to render the equipment safe have been made.

#### **M. PLACING OR REMOVING PROTECTIVE DEVICES**

1. In placing protective devices, on lines or apparatus, the conductor or apparatus nearest the employee shall be covered first. The next nearest conductor or apparatus shall then be covered. This procedure shall continue until all conductors or apparatus are covered.
2. All protective devices that are placed on conductors or apparatus to protect employees, shall be left in place until all work is completed.
3. When removing protective devices, they shall be removed first from conductor or apparatus farthest from the employee, leaving those nearest the employee to be removed last.
4. Employees shall avoid touching or leaning against protective devices covering energized lines or apparatus.
5. All protective devices shall be securely fastened, when necessary, to prevent their slipping from place.
6. Insulated barriers and line shields shall be provided with suitable cords and handles to permit them to be safely installed and removed.
7. When employees are working on equipment that has been de-energized and which is in proximity to equipment which is still energized, temporary barriers shall be erected to mark the limits within which work is to be done.

#### **N. GROUND WIRES AND GROUNDED NEUTRALS**

1. The presence of a grounded neutral, ground wire, or other grounded apparatus in the primary area can be hazardous to an employee while working on energized equipment. Under these circumstances, employees shall isolate themselves or use appropriate rubber or other protective devices to cover such conductors or apparatus.
2. Employees shall avoid opening ground wires or neutrals without first bridging the section to be opened with a suitable jumper.
3. When work is to be done on the ground grid in an energized substation, employees shall avoid opening wires of the grid without first bridging the section to be opened with a suitable jumper.

## 0. INSTALLING AND REMOVING JUMPERS

1. Employees shall avoid placing themselves in series with an electrical circuit.

Approved hot-sticks or mechanical jumpers may be used while making these connections.

2. Employees shall avoid opening or connecting jumpers or conductors (including neutrals) by hand when there is the possibility of creating a damaging arc because of a difference in potential or excessive load current. (The installation of a temporary load interrupting device or load pickup device may be necessary in certain instances.)
3. Approved hot-sticks shall be used to make transformer primary connections and other connections, where the possibility of equipment failure or excessive load may cause a damaging arc.
4. When permanent or temporary jumpers are to be installed which will bypass existing energized jumpers, switches, breakers, etc., extreme caution shall be taken to prevent cross-phasing. In congested areas, this may require communication between the employee who is making the jumper connections and the supervisor, before making each connection.

Attachment "A"  
Attachment "B"  
Attachment "C"  
Attachment "D"

Request for Shutdown  
Written Task Plan  
Task Review Attendance Sheet  
Step By Step Task Plan Review



**ELECTRICALLY HAZARDOUS TASK - REQUEST FOR SHUTDOWN**  
**ATTACHMENT A**

Site: \_\_\_\_\_ Area: \_\_\_\_\_ Project: \_\_\_\_\_

Planned start date: \_\_\_\_\_ Time: \_\_\_\_\_ Duration: \_\_\_\_\_

Description of work to be done: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

The following is requested to be shut down: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

1.) Until work is complete \_\_\_\_\_

2.) Temporarily while barriers are being placed \_\_\_\_\_

Requested by: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

(To be completed by facility owner)

When is the next available date for shutdown? \_\_\_\_\_

The above requested equipment shutdown:

1.) Will be performed \_\_\_\_\_ 2.) Will not be performed \_\_\_\_\_

If shutdown is denied, give reason(s) for denial \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Facility owner's signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date \_\_\_\_\_

HART Project Manager: \_\_\_\_\_ Date \_\_\_\_\_

**ELECTRICALLY HAZARDOUS TASK PLAN  
(WRITTEN TASK PLAN)**

**ATTACHMENT B**



To be completed, attached to Request for shutdown and submitted to Site Management for authorization.

1. Specify voltage levels involved: \_\_\_\_\_

2. Classification Factors (Check all appropriate categories):

hot work \_\_\_\_\_ voltage testing \_\_\_\_\_ proximity work \_\_\_\_\_

other hazardous work \_\_\_\_\_

high-level voltage \_\_\_\_\_ low-level voltage \_\_\_\_\_

high-level energy \_\_\_\_\_ low-level energy \_\_\_\_\_

3. Placement of Barriers: \_\_\_\_\_  
\_\_\_\_\_

4. Personal Protection:

This is not an all inclusive list. PPE and other equipment must be selected based upon the known and predictable hazards associated with electrically hazardous work. The prevailing OSHA regulations and NFPA standard's requirements must be included in the development of the task plan and the related work techniques.

a. voltage-rated gloves

b. leather gloves

c. voltage-rated equipment (test equipment):

voltage sensing \_\_\_\_\_

voltage measuring \_\_\_\_\_

other \_\_\_\_\_

d. guarded / insulated tools \_\_\_\_\_

e. Nomex body protections \_\_\_\_\_

f. Nomex hood \_\_\_\_\_

g. hard hat \_\_\_\_\_ h. face shield \_\_\_\_\_ i. Safety glasses \_\_\_\_\_

j. chemical protection \_\_\_\_\_

k. \_\_\_\_\_

l. other \_\_\_\_\_

5. Barricades and Signs:  
\_\_\_\_\_

6. Equipment:

How old? \_\_\_\_\_ Last maintained? \_\_\_\_\_

Visual inspection before beginning? \_\_\_\_\_

\_\_\_\_\_

7. Physical force on equipment? Special concerns? \_\_\_\_\_

Agreement of ID information, drawings and actual arrangement?

8. References used to prepare the plan (manuals, drawings, sketches)

\_\_\_\_\_

\_\_\_\_\_

9. Special concerns/precautions: \_\_\_\_\_

\_\_\_\_\_

10. Emergency information: \_\_\_\_\_

\_\_\_\_\_

11. Review and Authorization:\*\*

_____	_____	_____	_____
Plant Electrical Representative	Date	Engineer (Coordinator)	Date

_____	_____	_____	_____
Electrical Superintendent	Date	Lead Engineering	Date

_____	_____
Safety Specialist	Date

_____	_____	_____	_____
Resident Manager	Date	(This space for additional signature) (i.e., Resident System Owner/Engineer)	Date

\*Where a signature is not required, mark N/A and initial.

12. Job plan review with crafts persons performing work \_\_\_\_\_

## ELECTRICALLY HAZARDOUS WORK – TASK/WORK PLAN REVIEW

### ATTACHMENT C

**ATTENDANCE: PROJECT/SUBCONTRACTOR/CLIENT/VENDOR PERSONNEL**

**NAME:**

**COMPANY:**

**TRADE:**



**ELECTRICALLY HAZARDOUS WORK – TASK/WORK PLAN**  
Step-By-Step Outline of Work

**ATTACHMENT D**

**CAUTION: WORK MUST STOP AND BE RE-EVALUATED IF IT CANNOT BE EXECUTED AS PLANNED OR CONDITIONS CHANGE. STOP THE WORK – CONTACT SUPERVISION**

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**USE ADDITIONAL SHEETS AS NECESSARY**

## LADDER PROGRAM - INSPECTION AND EVALUATION GUIDE

### Guidelines

This checklist addresses regulations issued by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) under the construction standards 29 CFR 1926.1050 to 1926.1060. It applies to portable ladders used at temporary worksites associated with construction, alteration, demolition, or repair work including painting and decorating. The regulations cited apply only to private employers and their employees, unless adopted by a State agency and applied to other groups such as public employees. A 'yes' answer to a any question indicates that this portion of the inspection complies with the applicable OSHA and/or any other governing requirements.

1. Are ladders or stairways provided at all points of access that are elevated 19 inches or more, and no ramp, runway, sloped embankment, or personnel hoist is provided? [29 CFR 1926.1051(a)]
2. Does a competent person provide ladder training that teaches users how to recognize hazards and procedures for minimizing these hazards? [29 CFR 1926.1060(a)]
3. Is ladder retraining provided when necessary? [29 CFR 1926.1060(b)]
4. Can ladders support the load they are expected to carry? [29 CFR 1926.1053(a)(1)(i),(ii),and(iii)]
5. Are ladder rungs, cleats, and steps parallel, level, and uniformly spaced when the ladder is in position for use? [29 CFR 1926.1053(a)(2)]
6. Are rungs, cleats, and steps of portable ladders (other than step stools and extension trestle ladders) spaced at least 10 but not more than 14 inches apart (as measured between center lines of the rungs, cleats, and steps)? [29 CFR 1926.1053(a)(3)(i)]
7. Are rungs, cleats, and steps of step stools at least 8 but not more than 12 inches apart (as measured between center lines of the rungs, cleats, and steps)? [29 CFR 1926.1053(a)(3)(ii)]
8. Are rungs, cleats, and steps of the base section of extension trestle ladders at least 8 but not more than 18 inches apart (as measured between center lines of the rungs, cleats, and steps)? [29 CFR 1926.1053(a)(3)(iii)]
9. Are rungs, cleats, and steps of the extension section of extension trestle ladders at least 6 but not more than 12 inches apart (as measured between center lines of the rungs, cleats, and steps)? [29 CFR 1926.1053(a)(3)(iii)]
10. Is the clear distance between side rails for all portable ladders at least 11-1/2 inches? [29 CFR 1926.1053(a)(4)(ii)]

11. Are the rungs and steps of portable metal ladders corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping? [29 CFR 1926.1053(a)(6)(ii)]
12. Are ladders prohibited from being tied or fastened together to provide longer sections (unless they are designed for such use)? [29 CFR 1926.1053(a)(7)]
13. Is a metal spreader or locking device provided on each stepladder to hold the front and back sections in an open position when the ladder is being used? [29 CFR 1926.1053(a)(8)]
14. Are ladder surfaced to prevent injury from punctures or lacerations, and to prevent snagging of clothing? [29 CFR 1926.1053(a)(11)]
15. Is it prohibited to coat wood ladders with any opaque covering, except for identification or warning labels that are placed on only one face of a side rail? [29 CFR 1926.1053(a)(12)]
16. Do portable ladders extend at least 3 feet above the upper landing surface for which the ladder is used to gain access? [29 CFR 1926.1053(b)(1)]  

Note: As an alternative, secure the ladder at its top to a rigid support that will not deflect. Use a grasping device (such as a grabrail) to mount and dismount the ladder. The extension should never be such that the ladder deflection under load would, by itself, cause the ladder to slip off its support.
17. Are ladders maintained free of oil, grease, and other slipping hazards? [29 CFR 1926.1053(b)(2)]
18. Are ladders loaded at or below the maximum intended load for which they were built, or at or below the manufacturer's rated capacity? [29 CFR 1926.1053(b)(3)]
19. Are ladders only used for the purpose for which they were designed? [29 CFR 1926.1053(b)(4)]
20. Are non-self-supporting ladders used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately 1/4 of the working length of the ladder (the distance along the ladder between the foot and the top support)? [29 CFR 1926.1053(b)(5)(i)]
21. Are ladders used only on stable and level surfaces, unless secured to prevent displacement? [29 CFR 1926.1053(b)(6)]
22. Are ladders used on slippery surfaces ONLY when they are secured or provided with slip-resistant feet to prevent displacement? [29 CFR 1926.1053(b)(7)]  

Note: Do not use slip-resistant feet as a substitute for care in placing, lashing, or holding a ladder on surfaces such as flat metal or concrete that cannot be prevented from becoming slippery.

23. Are ladders secured to prevent displacement, especially in busy, high-traffic areas? [29 CFR 1926.1053(b)(8)] Note: As an alternative, a barricade may be used to keep the activities or traffic away from the ladder.
24. Is the area around the top and bottom of ladders kept clear? [29 CFR 1926.1053(b)(9)]
25. Is the top of a non-self-supporting ladder placed with the two rails supported equally, unless it has a single support attachment? [29 CFR 1926.1053(b)(10)]
26. Is it prohibited to move, shift, or extend ladders while they are occupied? [29 CFR 1926.1053(b)(11)]
27. Do ladders have nonconductive siderails if they are used where they could contact exposed energized electrical equipment? [29 CFR 1926.1053(b)(12)]
28. Is standing on the top or top step of a stepladder prohibited? [29 CFR 1926.1053(b)(13)]
29. Is climbing on the cross-bracing on the rear section of stepladders prohibited? [29 CFR 1926.1053(b)(14)]  

Note: This is allowed IF the ladder is designed and provided with steps for climbing on both front and rear sections.
30. Are ladders inspected periodically by a competent person and after any incident that could affect their safe use? [29 CFR 1926.1053(b)(15)]
31. Are portable ladders with structural defects (a) immediately marked in a manner that readily identifies them as defective, (b) tagged with DO NOT USE or similar language, or (c) withdrawn from service until repaired? [29 CFR 1926.1053(b)(16)]  

Note: Structural defects include broken or missing rails, corroded components, or other faulty or defective components.
32. Does a ladder that is repaired meet its original design criteria, before it is returned to use? [29 CFR 1926.1053(b)(18)]
33. Do all team members face the ladder when moving up or down the ladder? [29 CFR 1926.1053(b)(20)]
34. Do all team members use at least one hand to grasp the ladder when moving up or down the ladder? [29 CFR 1926.1053(b)(21)]
35. Is it prohibited to carry any object or load that could cause a person to lose balance and fall? [29 CFR 1926.1053(b)(22)]



# **SECTION 13**

# **LADDERS AND SCAFFOLDS**

**PORTABLE LADDERS - CONTROL AND INSPECTION**

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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

This section outlines general information on specifications, inspections and care of portable ladders.

## **A. DEFINITIONS**

### 1) Competent Person

As defined in 29 CFR 1926.32(f) as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them."

By contrast, a "qualified" person or engineer, as defined in 1926.32(l), might have more technical expertise, but would not necessarily have expertise in hazard recognition or the authority to correct identified hazards.

### 2) Type I Ladder

Portable ladder that is rated by the manufacturer to support no more than 250 pounds of weight (worker, materials and tools).

### 3) Type IA Ladder

Portable ladder that is rated by the manufacturer to support no more than 300 pounds of weight (worker, materials and tools). This is the minimum 'Duty Rating' for construction.

### 4) Type IAA Ladder

Portable ladder that is rated by the manufacturer to support no more than 375 pounds of weight (worker, materials and tools).

### 5) Portable Ladder

A ladder that can be readily moved or carried

### 6) Extension Trestle Ladder

A self-supporting portable ladder, adjustable in length, consisting of a trestle ladder and a vertically adjustable extension section, with a suitable means for locking the ladders together.

### 7) Step Stool (ladder type)

A self-supporting, foldable, portable ladder, nonadjustable in length, 32 inches or less in overall size, with flat steps and without a pail shelf, designed to be climbed on the ladder top cap as well as all steps. The side rails may continue above the top cap.

## **B. SAFE WORK PRACTICES**

1) Two or more people are not permitted to work from the same ladder unless it is specifically designed for two people. Safety instructions must be reviewed with team members before they are allowed to use a two-person stepladder.

2) Ladders shall only be used for the purposes, and in the proper configuration, as intended by the manufacturer.

3) Stepladders: Podium and Platform ladders are to be used, as opposed to traditional 'A-Frame' stepladders.

- a. Traditional 'A-Frame' stepladders are being phased out of general use at all HART worksites.
  - b. "Cross Step" type stepladders may be used in the folded and leaned' position, as these are designed and tested by the manufacturer for this type of use. Otherwise, all other step ladders shall not be used, folded, as straight ladders.
  - c. Extension ladders shall not be separated for use as two single straight ladders, unless indicated otherwise by the manufacturer.
  - d. Ladders shall not be used as any part of a scaffold's support system or walking/working surface.
- 4) All portable ladders shall be secured at each end as a precaution against being dislodged.
- a. Example:
    - i. Splice a 1/2-inch rope to the top back rung of stepladders or to the third rung from the top of straight and extension ladders to provide a tie-off rope when the ladder is set up.
    - ii. Similarly secure the lower end with rope or the use of cleats.
- 5) Ladders must exceed the landing level by a minimum of three feet. Extension ladders may be used for access, while step ladders are restricted to 'point work.'
- 6) Metal Ladders are not permitted on the HART Project worksite.
- 7) Fiberglass ladders are the HART standard and are preferred from sub-tier contractors.
- 8) Wooden ladders are permitted, but their use is discouraged.
- 9) Ladders that will be used in proximity to energized electrical services or for electrical work shall be of non-conductive construction and clean of dust and any other conductive material.
- a. For information on appropriate ladders for use in proximity to, or upon, electrical services and related equipment, refer to ANSI Standard A14.2.
- 10) The use of job-made ladders is permitted, providing that job-made ladders built to address a particular project site need follow the specifications delineated in OSHA 1926.1050.
- 11) Climbing trestle ladders is not permitted.
- a. Many specialty contractors use trestle ladders and extension trestle ladders as a tool of their trade; however,
  - b. trestle ladders are not designed for climbing as stated in the National Safety Council's Portable Ladders Data Sheet 1-655-Rev.1982.
    - i. Trestle ladders support planks or scaffold boards.
    - ii. When using trestle ladders for scaffold board supports, a separate ladder must be used to access the scaffold deck.

### **C. LADDER SPECIFICATIONS**

- 1) Type IA ladders are the minimum rating permitted for use on this project.
  - a. All ladders used within any HART worksite must feature a minimum duty

rating of TYPE IA, with TYPE IAA preferred.

- b. Ladders with a Type A rating or lower are not permitted on the HART Project site.
- 2) Straight ladders must not be longer than 20 feet.
- 3) Extension ladders must not be longer than 36 feet when fully extended.
- 4) Stepladders: Podium and Platform ladders are to be used, as opposed to traditional ‘A-Frame’ stepladders.
  - a. Traditional ‘A-Frame’ stepladders are being phased out of general use at all HART worksites.
- 5) All portable ladders; to include straight, extension, attic, manhole, platform podium and (any remaining) step ladders, must have non-slip feet.
  - a. For more information on these requirements, ref. ANSI Standard A14.1.
- 5) Stepladders, podium and platform ladders must not be longer than 12 feet as determined by the front rail.
- 6) Ladders may be constructed of wood or fiberglass. For more information on ladder construction, see ANSI Standard A 14.5.
- 7) Wooden ladders may not be painted, except for the platform and top step, which should be painted to indicate not to step there. Clear preservatives may be used so defects will not be hidden.

#### **D. INSPECTING LADDERS**

- 1) Ladders must be in good serviceable condition at all times. The user must inspect the ladder before each use.
  - a. Ladders must be inspected monthly by an employer’s designated competent person.
  - b. After periodically (monthly) inspecting and certifying all ladders, the employer’s designated competent person must attach and complete inspection tag that legibly includes
    - i. the inspection date and
    - ii. the inspecting team member’s initials.
- 2) Bends, dents, cracks, loose or missing rivets, disconnected braces and corrosion weaken a ladder seriously.
  - a. Carefully inspect the area around rivet points on fiberglass ladders for hairline stress cracks.
- 3) Destroy any defective ladders immediately, or
  - a. Tagged “DANGER DO NOT USE” and

- b. Remove them from the site to be destroyed.
- 4) The HART Competent Person shall initially complete inspections of each ladder at the worksite using the Ladder Program Inspection Guide, as attached at the end of this section. This may be reviewed periodically as required by any changing conditions in this project.

#### **E. STORING AND TRANSPORTING LADDERS**

- 1) Ladders are to be stored on racks protected from the elements, with good ventilation, and away from excessive heat.
- 2) Storage racks shall have sufficient supporting points to avoid sagging. Long ladders need support every 6 feet.
- 3) Do not put materials on stored ladders
- 4) Properly support ladders being transported on road, street and highway motor vehicles.
  - a. Supporting points should be made of material such as wood or rubber-covered iron pipe, to minimize chafing and the effects of road shock.

#### **SCAFFOLDING**

This procedure provides information concerning the types, component parts and accessories of ferrous metal scaffolds. All project operations concerning scaffolds should also comply with Accident Prevention Standards Manual Section 8-9.

#### **DEFINITIONS:**

- 1) **“Scaffold Competent Inspector”**  
Any team member that has been documented as to have completed training in the recognition of hazards specifically related to scaffolds, or certain types of scaffolds, and has demonstrated their ability and competency to inspect (certain) scaffold equipment and erected scaffolding system at their worksite. The ‘Scaffold Competent Inspector’ has the authority to, upon the recognition of a scaffold-related deficiency or hazard, ‘Stop Work’ any and all work being performed from, or upon, that scaffold until the issue is corrected by appropriately trained, competent and authorized personnel. The ‘Scaffold Competent Inspector’ shall also re-inspect the scaffold with the correcting contractor before the scaffold is placed back into service and opened to work.
- 2) **“Competent person rule for multi-employee construction worksites”** - When a General Contractor, or other Controlling Entity, contracts with a sub-tier activity, the General Contractor must not solely rely upon the sub-tier to protect against hazards relating to the sub-tier’s work and expertise. The Controlling Entity, to include General Contractors and Construction Managers, has the overall responsibility to ensure that subcontractors perform the work in a safe manner without exposing the team members to risk. The General Contractor and all other subcontractors may not solely rely on the sub-tier involved to provide the appropriate competent person, and must ensure that the subcontractor provides their ‘Competent Person’ in fulfilling their obligations as required.
- 3) **“Competent Person”** is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- 4) **“Qualified Person”** is one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

#### **A. SCAFFOLD TYPES**

- 1) Manufacturer’s frames, bracing, connecting pins and other accessories shall not be interchanged.
- 2) Sectional frame-lock scaffolds are made of various lengths of tubing clamped together by special patented couplers to support practically any desired shape of work on round, curved or other irregular-shaped objects.

#### **B. ERECTION AND DESIGN**

- 1) Must comply with OSHA Subpart L 1926.450-454 and Subpart X, 29 CFR 1926.1050-1060.
- 2) HART Companies policy requires all scaffolds provided to, and/or erected on, the Project site to be initially inspected by the ‘Qualified and Competent Erector.’ Provided/erected scaffolds will be fitted with an inspection tag holder at each point of access/entry onto the scaffold.

- 3) HART Companies maintains a 'Green Tag' policy regarding work being performed upon scaffolds, scaffold systems and scaffold-like structures (i.e., stair towers) and ready for use by all personnel and fitted with a Green tag.
  - a. Green-tagged scaffolds are ready for access and use, with all passive fall protection measures complete and in-place; such as
    - i. Guardrails complete with all mid-rails and toe-boards
    - ii. Self-closing gates at platform access points
    - iii. Covers or other protection at all holes and openings 2-inches or greater.
  - b. Yellow-tagged scaffold will not be accepted for use at this project site.
  - c. Red and Yellow tagged scaffolds will not be accessed for work other than tasks required to correct deficiencies.
  - d. Following completion of scaffold erection, the erecting contractor will inspect the installation and affix a Green tag, declaring the scaffold as acceptable and safe for trades use.
- 4) Scaffolds must be designed by a qualified person and must be constructed and loaded in accordance with that design.
- 5) A 'competent inspector', documented to have been trained in scaffold inspection, must inspect each scaffold daily or at the change of shift. A 'qualified scaffold erector' is not to be regarded as a 'competent inspector' unless that employee has been specifically trained by the employer for which any daily/pre-shift inspections are conducted.
- 6) Each scaffold and scaffold component must be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load applied or transmitted to it.
- 7) Direct connections to roofs and floor and counterweights must be capable of resisting at least 4 times the tipping moment or 1.5 (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.
- 8) Each suspension rope, including connecting hardware, must be capable of supporting at least 6 times the maximum intended load applied or transmitted to that rope with the scaffold operating at either the rated load of the hoist, or 2 (minimum) times the stall load of the hoist, whichever is greater.
- 9) The stall load of any scaffold hoist shall not exceed 3 times its rated load.
- 10) Each platform unit must be installed so that the space between adjacent units and the space between the platform and uprights is no more than 1 inch (2.5 cm) wide, except when the employer can demonstrate that a wider space is necessary (i.e., to fit around uprights when side brackets are used to extend the width of the platform). In such case, the platform must be fully planked or decked and the remaining open space between the platform and the uprights must not exceed 9 1/2 inches (24.1 cm). This requirement does not apply to platforms used solely as walkways or solely by employees performing scaffold erection or dismantling. In these situations, only the



planking that the employer establishes necessary to provide safe working conditions is required.

- 11) Each scaffold platform and walkway must be at least 18 inches (46 cm) wide. Where the scaffold must be used in areas that the employer can demonstrate are so narrow that platforms and walkways cannot be at least 18 inches (46 cm) wide, such platforms and walkways must be as wide as feasible, and employees on those platforms and walkways must be protected from fall hazards by the use of guard rails and/or personal fall arrest systems.
- 12) Each ladder jack scaffold, top plate bracket scaffold and pump jack scaffold must be at least 12 inches (30 cm) wide. There is no minimum width requirement for boatswains' chairs.
- 13) The front edge of all platforms must not be more than 14 inches (36 cm) from the face of the work unless guardrail systems are erected along the front edge and/or personal fall arrest systems are used to protect employees from falling.
- 14) The maximum distance from the face for outrigger scaffolds must be 3 inches (8 cm) and the maximum distance from the face for plastering and lathing operations must be 18 inches (46 cm).
- 15) Each end of a platform, unless cleated or otherwise restrained by hooks or equivalent means, must extend over the centerline of its support at least 6 inches (15 cm).
- 16) Each platform:
  - a) 10 feet or less in length must not extend over its support more than 12 inches (30 cm) unless designed so that the cantilevered portion of the platform can support employees and/or materials without tipping or has guard rails which block employee access to cantilevered end.
  - b) Greater than 10 feet in length must not extend over its support more than 18 inches (46 cm) unless designed so that cantilevered portion of platform can support employees and/or materials without tipping or has guard rails which block employee access to cantilevered end.
- 16) On scaffolds where planks are abutted to create a long platform, each end must rest on a separate support surface. Where platforms are overlapped, the overlap must occur only over supports, and must not be less than 12 inches (30 cm) unless the platforms are nailed together or otherwise restrained to prevent movement.
- 17) Wood platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; **however, the coating may not obscure the top or bottom wood surfaces**, except that platform edges may be covered or marked for identification.
- 18) Tipping Restraint .Supported scaffolds, with a height to base width ratio of more than 4:1, must be restrained from tipping by guying, tying or equivalent as follows:

- a) Guys, ties, and braces must be installed at locations where horizontal members support both inner and outer legs.
  - b) Guys, ties and braces must be installed according to scaffold manufacturer's recommendations or at the closest horizontal member to the 4:1 height and must be repeated every 20 feet (5.1m) or less horizontally for those 3 feet (0.91 m) wide or less, and every 26 feet (7.9 m) or less for scaffolds greater than 3 feet (0.91 m) wide. The top guy, tie or brace of completed scaffolds must be placed no further than the 4:1 height from the top.
  - c) Such braces must be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet (9.1 m) measured from one end towards the other (not both toward center).
  - d) Ties, guys, braces or outriggers must be used to prevent the tipping of supported scaffolds in all circumstances where an eccentric load, such as a cantilevered work platform, is applied or is transmitted to the scaffold.
- 19) Supports must bear on base plates and sills regardless of bearing surfaces (walking/working level, foundation or structure);
- a) must be plumb and braced to prevent swaying and displacement.
  - b) Footings must be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
  - c) Base plates must be secured to sills
  - d) Only sills are to contact the bearing surfaces.
- 20) Suspension Scaffolds
- a) Counterweights must be made of non-flowable material specifically designed as counterweights.
  - b) Sand, gravel and similar 'flowable' materials, regardless of containment' that can be easily dislocated cannot be used as counterweights.
  - c) Construction materials such as, but not limited to masonry units and rolls of roofing felt, cannot be used as counterweights.

### **C. SCAFFOLD INSPECTION - TAGGING**

- 1) The Scaffold Foreman responsible for the erection of all scaffolds is to inspect the scaffold or work platforms to assure that all applicable safety measures such as guardrail systems (complete with midrails and toeboards), access ladders, self-closing gates, etc., have been provided, (also see section B, design).
- 2) Scaffolds shall be RED tagged "DO NOT USE" while being erected.
- 3) Scaffolds that are not safe for use are to be tagged at a visible location with a RED "UNSAFE FOR USE" tag.
- 4) Team members are not permitted to work on a RED tagged scaffold.

- 5) Any scaffold that is ***not*** tagged, regardless of reason, shall be assumed to be “UNSAFE FOR USE.”
- 6) The cognizant erector of record will place a GREEN “SAFE FOR USE” tag on all completed scaffolds, scaffold systems and scaffold-like structures (stair towers) meeting prevailing Industry and OSHA Scaffolding Guidelines when complete.
  - a. The ‘Green Tag’ is to be attached at all points of entry to the scaffold, where it is visible to any team member before they climb any ladder or otherwise access the platforms.
  - b. The ‘Green Tag’ must be signed and dated by the Project’s trained and designated ‘Competent Inspector’ for that specific scaffold type each day, at the beginning of each shift, before team members are allowed to access the scaffold, scaffold system or scaffold-like structures.
- 7) Alterations, modifications and repairs which must be made to a Green tagged scaffold, are to be re-inspected and re-tagged by the Project’s trained and designated ‘Competent Inspector’ and the correcting contractor who is responsible for the modification or corrective work. A new Green scaffold inspection tag is to be placed on the scaffold/platform.
- 8) In the event a scaffold or platform cannot be erected in accordance with the applicable codes, i.e., handrails or equivalent fall protection, a YELLOW tag is to be installed on the scaffolding, until the design is reconfigured and will satisfy the requirements for ‘open use’ and a Green tag is affixed by the erecting or correcting contractor.
  - a. In these circumstances, the ‘YELLOW Tag’ will have a warning message such as;
 

“INCOMPLETE GUARDRAILS AND HOLES PRESENT”  
 “PERSONAL FALL ARREST EQUIPMENT AND 100% TIE OFF REQUIRED”

Or

“INCOMPLETE GUARDRAILS AND HOLES PRESENT”  
 “FALL PROTECTION, 100% TIE OFF REQUIRED.”
- 9) HART Project employees observed working on a YELLOW tagged scaffold, not engaged in corrective work, and working without required additional fall protection means, are subject to immediate disciplinary action and/or dismissal.

**D. TRAINING - General**

- 1) Employers are required to train each team member and provide them with the skills and knowledge necessary to perform their work safely. The type of employee training should include initial orientation, on-the-job instructions (toolbox safety meetings, safety task assignment, etc.) and formal classroom training.
- 2) Further training is required of employers whose personnel will be working with specific hazards such as ladders, scaffolds, trenching and excavations and fall protection.
- 3) Information must be provided to all employees in a manner understandable to them (bi-

lingual instruction, interpreters, audio-visual aids, graphics, etc.).

- 4) Scaffold User training must include:
  - a) Scaffold Hazard Awareness
    - i. Scaffold Hazards
    - ii. Hazards related to Tasks Performed On Scaffolds
  - b) Scaffold Use Requirements
  - c) Scaffold Industry Best Practices; Accident/Incident/Injury Prevention
  - d) Scaffold Inspection Basics; Scaffold User Level
  - e) Scaffold Use Limitations
    - i. Platform Loading Limits
      1. Weight Per Square Foot
      2. Duty Rating
        - a. Light
        - b. Medium
        - c. Heavy
  - f) Scaffold Personal Protective Equipment Requirements
    - i. All HART Companies Required PPE at a Minimum;
      1. Head Protection – 100%
        - a. Hard Hats Must Be Worn While Performing Any Work Upon, Beneath or Adjacent To Scaffolds, Scaffold Systems, and Scaffold-Like Structures (i.e., Stair Towers).
      2. Eye Protection – 100%
      3. Hand Protection – 100%
      4. Foot Protection – 100%
  - g) Fall Protection Training – especially where Personal Fall Arrest System (PFAS) equipment is required.
- 5) Fall Protection training should include:
  - a) Fall Hazard Awareness
  - b) Safe Work Practices to Prevent Falls;
  - c) Methods for carrying out specific task assignments;
  - d) Correct Selection, Use, Fit, Care, Maintenance and Storage of Personal Protective Equipment (PPE);
  - e) Correct Selection, Use, Fit, Care, Daily pre-use Inspection, Maintenance and Storage of Personal Fall Arrest Systems and Fall Restraint equipment;
  - f) Correct Procedures for Selecting, Erecting, Maintaining, Disassembling, and Inspection of Fall Protection systems;
  - g) Hazards associated with the use of Personal Fall Arrest Systems use, such as;

Maximum Arresting Forces, Fall Distances, Swing Fall, Vertical and Horizontal Lifelines, Vector Forces, Rescue, Suspension Trauma.

- h) Proper Construction, Use, Placement, and Care in the handling of all Stairways and Ladders;
- i) information regarding the nature of fall hazards in the work area;
- j) Handling and Storage of equipment and materials and Erection of Overhead Protection;
- k) Use and Operation of guard rail systems, Personal Fall Arrest Systems, Safety Net systems, Warning Line systems, Safety Monitoring systems, Controlled Access Zones, etc.;
- l) Role of each team member in safety monitoring systems where applicable;
- m) Emergency Procedures; such as rescue, accident or injury;
- n) Accident/Incident/Near Miss Reporting systems; and
- o) Recordkeeping procedures and systems.

#### **E. WORKPLACE ASSESSMENT**

- 1) Pre-project Scaffold Use and Fall Hazard analyses conducted by a appropriately developed 'Competent Persons'.
- 2) This should also include continuous follow-up review of procedures and hazard analyses throughout all phases of the project, especially at changes of phase.

#### **F. HAZARD CONTROL AND HEIRARCHY OF CONTROLS**

- 1) If it is determined that a hazard or risk exists, systems of procedures and practices must be implemented to eliminate or minimize the risk. If these work procedures and practices are not sufficient to prevent or eliminate the risk, other control measures must be implemented to do so. The approach to eliminating risk must be done in accordance with the hierarchy of controls in the following order of precedence;
  - a) Engineering Controls: are preventative or protective measures that eliminate or reduce exposure to a workplace hazard through the use or substitution of engineered machinery, equipment or material(s). Examples include ventilation systems, personnel lifts, specialty tools, sound-dampening materials to reduce noise levels, safety interlocks, and radiation shielding.
  - b) Administrative Controls: (or work practice controls) are changes in work procedures such as written safety policies, rules, supervision, schedules, sequencing and training. The goal of Administrative Controls is the reduction of the duration, frequency, and severity of exposure to workplace hazards,

hazardous chemicals or other risk exposures.

- c) Personal Protective Equipment (PPE): incorporates protective gear designed to protect the worker from hazards that are present within the worksite and have not been eliminated. PPE includes all clothing and other work accessories designed to create a physical barrier against workplace hazards. Examples include safety goggles, blast shields, hard hats, hearing protectors, gloves, respirators, aprons, and work boots.
  - i. PPE is understood to be a ‘last line of defense’ and must not be used as a primary approach to addressing any hazard.
  - ii. PPE is not a substitute for engineering, work practice, and/or administrative controls to prevent exposure to hazardous chemicals
    - 1. For example, a respirator is not meant to be worn by an assembly line worker during his/her entire work shift; other methods such as a ventilation system or replacement of hazardous substances/processes should be utilized.
    - 2. However, PPE can work in conjunction with such preventative measures or when such controls are not possible.

**REMEMBER:**

Personal Protective Equipment (PPE) protects only the individual user, if properly fitted and used appropriately, However! – PPE does nothing to remove the hazard from the workplace. The hazards and dangers are still there, and are a threat to all the team members!

For example, a respirator may help protect the wearer from toxic fumes, but it does nothing to protect the other workers in the vicinity as the toxic fumes still exist.

# **SECTION 14**

# **FALL PROTECTION**

**FALL PROTECTION**



The safeguarding of team members that work in elevated locations is critical. Knowledge, prediction and anticipation of workplace Fall Hazards, coupled with an understanding of prevailing ‘Industry Best Safe Work Practices’, will lead to the development of the best ‘Fall Protection’ program – an appropriate and effective strategy that focuses ‘Fall Prevention.’

The ‘Fall Prevention’ strategy should incorporate schedule, logistics and other ‘scope of work’ programming considerations, that lead to the selection of appropriate practices and equipment such as guardrails, covers for holes and openings, Fall Restraint and other controls. Passive systems, such as guardrails and covers, must be preferentially considered before giving progressively dangerous alternative considerations to practices such as worker positioning, personal fall arrest systems, lifelines, and monitors. Floor and wall openings, steel erection, decking, floor loading and similar work require additional protective measures for the team member and others near them.

HART Companies’ requires the following main considerations regarding falls;

- 1) **Any and all work at six feet or greater requires Fall Prevention/Protection to guard personnel against injury/risk.**
- 2) **Any and all work at a height less than six feet, but above a dangerous surface, material or substance, requires Fall Prevention/Protection to guard our team members against injury or risk.**
- 3) **Any and all work at any height less than six feet, but above dangerous equipment or other operational hazards, requires Fall {Prevention/Protection to guard our team members against injury or risk.**

This section of the HART Companies’ program will highlight the elements of preventative strategies related to;

- Schedule programming,
- Operational sequencing and planning,
- Trades coordination
- Worksite materials/logistical cycles alignment.

The goal and focus of Fall Prevention is to eliminate the existence of any fall hazard before our team members are unnecessarily exposed.

Here in this section, we also outline some standard Fall Protection methods that include;

- Fall Restraint,
- Worker Positioning,
- Personal Fall Arrest Systems
- and the practices of selecting wearing, using and inspecting full body harnesses, lanyards, Self-Retracting Lifelines, Vertical and Horizontal Lifeline systems, anchorages and connectors - commonly known as fall protection devices.

**HART Companies does not, and will not, accept ‘Safety Monitors’ as an effective means of a ‘Fall Prevention’ strategy, nor a ‘Fall Protection’ plan.**

## A. DEFINITIONS

### 1) Anchorage Point

A secure point of attachment for lifelines, lanyards or other deceleration devices capable of supporting 5,000 pounds.

2) **Authorized Person**

A person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite.

3) **Competent Inspector**

An employee that has been documented as to have been trained in the recognition of hazards specifically related to Personal Fall Arrest Systems equipment, or certain types of PFAS equipment, and has demonstrated their ability and competency to inspect PFAS equipment. The competent inspector has the authority to, upon the recognition of a PFAS equipment-related deficiency or hazard, 'stop work' work upon that scaffold until the problem is corrected by trained personnel. The Competent Inspector shall also re-inspect the scaffold with the correcting contractor before the scaffold is placed back into service and opened to work.

4) **Competent Person**

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

5) **Cover**

A device that protects employees from fall and tripping hazards exposures when holes are present.

- a) Covers must be secured in place,
- b) Covers must effectively support two times the anticipated load on the related walking/working surface.
- c) Covers must be highlighted 'orange' or other contrasting color,
- d) Covers must be marked "HOLE" or "COVER."
- e) Covers must also be marked "DO NOT REMOVE" when possible.
- f) Covers must be marked with the name of the company that owns the corresponding penetration.

6) **Full Body Harness**

A device with webbing/straps which may be secured about an employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

7) **Guard Rail Systems**

An arrangement of horizontal rails and vertical posts that form a barrier about the work area that is designed and constructed to protect employees from a fall, or falling to a lower level.

- a) Guard rails systems are not considered complete unless they are comprised of posts, top rails, mid rails and toe boards.
- b) All guardrail systems installed by HART Engineering shall be complete with toe-

boards, and constructed in accordance with the applicable OSHA standards and industry best practices.

- c) Guardrail system functional requirements (minimum)
  - 1. Rail Heights (above the walking /working level; AW/WL):
    - a. Top Rails: 42-inches, +/- 3-inches
    - b. Mid-Rails: installed evenly between the Top-Rail and the walking/working level, or at a nominal 21-inches.
    - c. Toeboards: installed with not more than 1/4-inch above
  - 2. Rail Strengths (shall withstand the following without failure):
    - a. Top Rails: 200 pounds of force applied in any direction, without more than 3” of vertical deflection
    - b. Mid-Rails: 150 pounds of force applied in any direction, without more than 3” of vertical deflection
    - c. Toeboards: 50 pounds of force applied in any direction, without more than 3” of vertical deflection
- d) Guard rail systems must only be constructed of the following materials in accordance with OSHA’s 29 CFR 1926. Subpart M, Appendix B in order to meet or exceed the criteria highlighted in ‘c) 1., and c) 2., above;
  - 1. Wood Railings:
    - a. 2-inch X 4-inch (nominal size) (stress grade) construction grade lumber
    - b. Posts not spaced more than 8-feet apart (on center)
    - c. All Top- rails, Mid-rails and Toeboards are to be at least 2-inch x 4-inch (nominal size)
  - 2. Pipe Railings:
    - a. 1-1/2-inch (nominal) diameter Schedule 40 steel pipe
    - b. Posts not spaced more than 8-feet apart (on center)
  - 3. Structural Steel Railings:
    - a. 2-inch x 2-inch x 3/8-inch structural angles
    - b. Posts not spaced more than 8-feet apart (on center)
  - 4. OTHER MATERIALS:
    - a. The use of other materials than those specifically listed in this section above (1., 2., 3.) is prohibited without;
      - i. Supporting documentation of material characteristics
      - ii. Review of the strength of the supporting and/or mounting surface(s)
      - iii. Documentation confirming the installed guardrail system meets or exceeds the prevailing OSHA requirements of 1926.502(b)(3), (4) and (5).
      - iv. Express written acknowledgement and concurrence of the HART

Companies Corporate Safety Director.

- e) Guard rails must also be fitted with mesh/netting whenever materials could be displaced over a toeboard and fall to a lower level.
  - f) Guardrails that are used around holes and other features which are used as points of access (such as ladder ways), shall be fitted with a gate, or be so offset that a person cannot walk directly into the hole or access opening.
- 8) **Hole**  
Any gap or void in a floor, roof or other walking/working surface, that is two inches or greater in its least dimension.
- 9) **Lanyard**  
A flexible line of rope, wire rope or webbing/straps which has a connector at each end for connecting the body harnesses to a deceleration device, lifeline, or anchorage point.
- Lifeline**  
A flexible line for connection to an anchorage point at one end to hang vertically (vertical lifeline), or for connection to anchorage points at both ends to support horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.
- 10) **Opening**  
Any gap or void 30 inches or more high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level. Openings will require the use of guardrails or other effective means of Fall Protection to keep employees from falling to any lower level.
- 11) **Personal Fall Arrest System**  
A system used to arrest an employee's fall from a working level. It consists of an anchorage point, a full-body harness, connectors, deceleration device, lifeline, or approved combination of these.
- 12) **Self - Retracting Lifeline/Lanyard**  
A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, upon the onset of a fall event, automatically locks the drum to arrest the employee's fall.
- 13) **Qualified Person**  
One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
- 14) **Rescue Plan**  
The established action plan, developed by HART Project Management, to rescue a worker that has fallen while working at elevation, whose fall has been arrested by their PFAS equipment. Such plans must be documented, delineate roles and responsibilities, and provide for on-site rescue equipment. The rescue plan must include provisions for periodic review and drills.

**NOTE: All fall arrest systems shall be equipped with a shock absorber mechanism and/or automatic deceleration device.**

**B. CIRCUMSTANCES REQUIRING USE**

**HIERARCHY OF RISK CONTROLS:**

As Personal Fall Arrest Systems/equipment is considered to be Personal Protective Equipment (PPE), all other options to affect the work must be reviewed and proven to be unacceptable. The order of precedence in applying risk, or hazard, control is regarded as the following;

1) ENGINEERING CONTROLS – HAZARD REMOVAL

- a. Eliminate the Hazard
- b. Substitute Hazardous Materials, Tools or Processes with Non-Hazardous Alternatives

2) ADMINISTRATIVE CONTROLS – ALTERNATIVE APPROACHES

- a. Do The Work When The Hazard Is Not Present By Establishing
  - i. Alternative Work Plans
    - 1. Scheduling Programming Considerations
    - 2. Trades Coordination
    - 3. Workflow Alignment
    - 4. Alternate Work Hours
  - ii. Policies
  - iii. Procedures
  - iv. Combination of Protective Procedural Controls and PPE

3) PERSONAL PROTECTIVE EQUIPMENT (PPE)

- a. Must Be Understood To Be The Team Member’s ‘Last Line of Defense’
- b. Must Be Only Considered When All Other Alternatives Are ‘Infeasible’

Reasons of fiscal, production inconvenience or schedule impact are not acceptable as justification of ‘Infeasibility’ to not employ engineering and/or administrative controls. The primary approach to the work with a potential fall exposure/risk is to remove/minimize the hazard through the use of Engineering and/or Administrative Controls, as Fall Arrest protective means do not function until an employee has actually fallen from an elevated working position.

Effective Fall Protection means are required and shall be used in the following circumstances:

- 1) on all stages, floats, or certain types of scaffolding, such as suspended scaffolding;
- 2) on all scaffolds with incomplete decking or incomplete guardrail systems

- 3) on sloping roofs;
- 4) within six feet of the edge of floors, decks or roofs where there are not guardrails or perimeter fall protection systems installed and maintained;
- 5) when removing floor planks, hole covers, grating, etc., from the last panel in a temporary floor;
- 6) in any unprotected elevated location six feet in height or more;
- 7) in positions at any elevation less than six feet high, and above any hazardous surface
- 8) in positions at any elevation less than six feet high, and above any dangerous equipment or hazardous materials, substances or processes
- 9) at any height when in areas with exposures to protruding, unprotected, reinforcing steel.

**C. MANNER OF USE**

When circumstances require the use of Personal Fall Arrest Systems/equipment (PFAS), and only when the result of a work plan evaluation that indicates that PFAS is the only option to approach the work, such equipment shall be used in the following manner:

- 1) Employees required to wear a full-body harness must have training regarding:
  - a. Hazards associated with PFAS use
  - b. Requirements of the prevailing standards
    - i. OSHA 1926.500
    - ii. ANSI Z349
  - c. Selection of PFAS systems equipment as appropriate to the given task
  - d. Inspection criteria for PFAS systems equipment
  - e. PFAS systems equipment manufacturers' requirements
  - f. How to properly don, adjust and wear the full-body harness
  - g. PFAS systems equipment use, care, maintenance and storage
- 2) Connective devices, including SRLs and lanyards, shall be secured to the full-body harness and appropriate anchorage points meeting the prevailing ANSI and OSHA requirements. Anchorages must be located immediately above the worker (overhead).
- 3) PFAS systems equipment shall be configured in a manner that;
  - a. will prevent any effective free-fall distance of more than five (5) feet,
  - b. will prevent any team member from falling and striking any lower level, any equipment or other hazard within the work area.
- 4) Lanyards and/or safety harnesses shall not be used for any other purpose.

**D. PERSONAL FALL ARREST SYSTEMS – EQUIPMENT INSPECTION**

## **A. PRIOR TO USE**

Prior to each use, the 'trained Authorized User' must conduct a visual inspection of the full-body harness, and other PFAS system equipment that they will use. This inspection is not required to be documented, and is performed by the trained 'Authorized User'. This must include a review of the following items;

- a) Manufacturer's Tag;
  - i. Use Instructions
  - ii. Capacity Rating
  - iii. Limitations
- b) Stitching
- c) "D" rings
- d) Buckles
- e) Lanyard
- f) Buckle tabs
- g) Fastenings, metal parts and other 'hard goods' components

The 'trained Authorized User' inspection should be reviewing at least the following, with any of these instances as grounds for 'Removal From Service';

- a) General Overall Condition
- b) Damage: Manufacturer's tag is missing/detached/partially torn
- c) Damage: Information on manufacturer's tag is worn, illegible, missing
- d) Damage: Deterioration
- e) Damage: Heat Burns
- f) Damage: Friction Burns
- g) Damage: Frayed or broken fabric
- h) Damage: More than two broken stitches in any running patter,
- i) Damage: Bent, Broken or Misshapen Fittings
  - 1. buckles, springs, retainers, grommets
  - 2. Any 'hard good' item improperly performing
- j) Damage: Splices
- k) Damage: Paint, Concrete, Adhesives, Grease, Embedded Debris
- l) Any other observable or otherwise indicated damages, and/or wear

## **B. MONTHLY INSPECTION**

Once a month, a visual inspection shall be made by a Competent Inspector who will inspect the equipment components for wear and damage to include the following:

- h) Manufacturer's Tag;
  - i. Use Instructions
  - ii. Capacity Rating
  - iii. Limitations

- i) Stitching
- j) “D” rings
- k) Buckles
- l) Lanyard
- m) Buckle tabs
- n) Fastenings, metal parts and other ‘hard goods’ components

The ‘trained Authorized User’ inspection should be reviewing at least the following, with any of these instances as grounds for ‘Removal From Service;

- m) General Overall Condition
- n) Damage: Manufacturer’s tag is missing/detached/partially torn
- o) Damage: Information on manufacturer’s tag is worn, illegible, missing
- p) Damage: Deterioration
- q) Damage: Heat Burns
- r) Damage: Friction Burns
- s) Damage: Frayed or broken fabric
- t) Damage: More than two broken stitches in any running patten,
- u) Damage: Bent, Broken or Misshapen Fittings
  - 1. buckles, springs, retainers, grommets
  - 2. Any ‘hard good’ item improperly performing
- v) Damage: Splices
- w) Damage: Paint, Concrete, Adhesives, Grease, Embedded Debris
- x) Any other observable or otherwise indicated damages, and/or wear

The periodic ‘documented’ inspection is a more comprehensive review of the PFAS system equipment’s general condition and damages such as; cuts and abrasions or burns. The Competent Inspector shall complete the PFAS Inspection Form as provided by the manufacturer, and forward it to the HART Project Office or the appropriate Designated Safety Competent Person at the project.

Best Practice: Mark the harness with colored tape that corresponds to the ‘Assured Grounding Monthly Color Code’. Place the color coded tape on the PFAS full-body harness (or other PFAS systems equipment) in a location where it is visible and will not impede the free movement, or other performance of, any component of the PFAS system equipment.

### **C. ANNUAL INSPECTION**

All Personal Fall Arrest System(s) equipment shall be reviewed annually with a documented inspection, performed by a Competent Person/Inspector in accordance with the following specifications;

- a) ANSI A10.32-2004 (Equipment):
  - 1. Inspection Prior to use;
  - 2. Inspection of equipment semi-annually by a competent person;



3. Removal of equipment following fall arrest
- b) ANSI Z359.1-1992 (Protection of Personnel):
  1. Inspection Prior to use;
  2. Inspection of equipment each year by a competent person
  3. Comply with Original Equipment Manufacturer's requirements, recommendations, suggestions, directions.
- c) Manufacturer's Requirements – DBI/SALA

#### **D. REMOVAL FROM SERVICE**

##### **DAMAGES AND WEAR:**

- a) Any PFAS system component is subject to Removal From Service (use) whenever;
  1. Any of the above highlighted conditions are observed
  2. Subjected to any 'Fall Event'
  3. Subjected to any use other than as intended by the manufacturer
  4. Subjected to any conditions considered as 'severe duty' by regulatory codes, project requirements, other prevailing industry standards.

##### **MODIFICATIONS AND ALTERATIONS:**

- b) PFAS equipment will not be modified or altered in any way.
- c) Modifications/Alterations to PFAS equipment, changing the equipment's condition as provided by the respective manufacturer, is expressly prohibited.
- d) Any PFAS system component that has been altered in any way is to be immediately removed from service (use) and from the worksite whenever;
  1. Observance of any alterations or modifications not specifically authorized by the PFAS equipment manufacturer in writing. Alterations include;
    - i. Additional holes punched in webbing,
    - ii. Excessive webbing cut/trimmed off,
    - iii. "D" ring assemblies or other hardware altered or removed,
    - iv. Harnesses otherwise modified or altered.

##### **REMOVAL ACTIONS AND PRECAUTIONS:**

- e) Any PFAS systems equipment that is damaged in any way must be taken out of use, tagged as 'Out Of Service' and immediately removed from the worksite.
- f) Any PFAS systems equipment that is modified or altered in any way, other than as expressly authorized by the manufacturer, must be taken out of use, tagged as 'Out Of Service – Do Not Use' and immediately removed from the worksite.
- g) Any defective and/or damaged equipment that cannot be immediately removed from the worksite must be

1. segregated from all other equipment, and
  2. secured against unauthorized and unintentional use.
- h) The Project Supervisor must make arrangements to ensure that any ‘segregated and secured’ damaged and/or defective equipment is removed from the worksite as soon as possible.
- i) Any actions relative to damaged and/or defective equipment tagged as ‘Out Of Service – Do Not Use’ and ‘Removed from the Worksite’ or ‘Destroyed’ must be included in the Project’s Daily Report.

## **E. HORIZONTAL AND VERTICAL LIFE LINES**

- 1) PURPOSE:
  - a) Provide guidance in the installation and use of Horizontal and Vertical Life Lines (HLLs, VLLs) as a form of ‘Active’ Fall Protection in elevated work areas, or where ‘Work At Height’ is required, and cannot be protected otherwise with the use of Engineering or Administrative controls.
- 2) USE:
  - a) Horizontal and Vertical Lifelines shall be installed and used only when no other means of fall protection is infeasible (ref: B, ‘Hierarchy of Risk Controls’).
- 3) GUIDELINES:
  - a) Horizontal Life Lines (HLLs) must be designed by a Qualified Person;
    - 1) registered as a Professional Structural Engineer,
    - 2) Carrying a ‘wet stamp’ for the state in which the system is to be installed/used.
    - 3) Possessing demonstrated experience in the design, development and installation of HLLs to provide Fall Protection to active trades work.
  - b) Horizontal Life Lines (HLLs) shall be installed as high as possible above the walking and/or working elevation for which it is intended (at least 72 inches as a minimum).
    - 1) For every 12-inches above the walking/working elevation, the HLL’s design capacity must be increased by a factor of ‘1’, multiplied by the individual design load of 5,000 pounds per person.
      - i. EXAMPLE: Design Load required to support a single team member working with the use of an HLL at an elevation of seven feet above the working/walking level (AW/WL) must be considered with the following parameters before the size of the vertical posts, intermediate vertical posts, wire rope cable and associated hardware and fittings;
        1. 5,000 lbs design load for a single team member
        2. Design elevation factor for each foot above the walking/working level, is equal to 12” X 7 feet AW/WL = 7
        3. Design Load = 5,000 lbs X 7 = 35,000 lbs/team member attached

- 2) The size of the HLL system components, such as vertical posts, intermediate vertical posts, bay structures, wire rope cable and associated hardware and fittings, must only be determined after the total Design Load has been developed and confirmed by the Qualified Person (Professional Engineer) of Record.
- 3) Given the implication of applied structural forces potentially generated in a Fall Event involving installed HLLs, it is preferred that the HLL system is not attached to the building's structure.
  - i. HLL systems equipment should be supported by vertical posts/king-posts developed and incorporated into the HLL's overall design.
  - ii. When prevailing circumstances require the use of existing structures as a means of supporting the installation and use of any HLL system, the Qualified Person (PE of Record) must;
    1. evaluate the existing structure to be used
    2. issue a definitive determination that confirms that the intended existing structure/structural components
      - a. meets the design load requirements (B.1, this section)
      - b. will not experience any adverse effects from any vector/impact forces generated by any Fall Event involving the subject HLL system.
- 4) The HLL shall be comprised of not less than one half (1/2") inch steel cable, and able to withstand a 5,000 pound drop and maintain tensile strength integrity of the Cable material.
- 5) The horizontal lifeline shall be installed in a length not to exceed two hundred (200') feet. The live ends should be attached in such a manner that the ends are wrapped around a fixture so that it is facing the work area. As it is wrapped, a softener shall be installed to keep the cable from being marred or kinked.
- 6) The cable shall be wrapped no less than one complete wrap around a certified beam, or other certified structural feature, and secured with no less than three (3) Wire Rope Cable clips of an appropriate size, configuration and strength.
  - i. Number of Wire Rope Clips required is determined by the size of the wire rope cable and the intended design strength (OSHA 1926.252, Table H-2, as a basic level with strength considerations developed further)
  - ii. Designs incorporating stainless steel wire rope cable and associated stainless steel fittings must consider the comparative lesser strength of stainless steel alloys, in contrast to the strengths of carbon steel alloy material components.
  - iii. Prior to securing the cable, it shall be tensioned to at least 100 pounds (torque).
- 7) Any Horizontal Life Line system designed by a Qualified Person (PE of Record) must be installed

- i. by a Competent Person with experience in the installation of HLL systems to support active trades work.
  - ii. under the direct supervision of the Qualified Person (PE of Record)
- 8) During installation, and as the cable is passed through each bay, it shall be attached/supported in increments of not greater than 50 foot runs. To maintain the HLL's intended working elevation AW/WL, and address the life line's sag, the supporting material must be affixed in such a manner to be immobile.
- 9) The HLL's strength, integrity and torque must be inspected;
  - i. at least prior to each shift when in use,
  - ii. in accordance with any requirements, suggestions, recommendations and directions provided by
    - 1. the Qualified Person (PE of Record for Design)
    - 2. the Original Equipment Manufacturer (OEM) for HLL systems purchased as a commercially available assembly.

**F. Guard Rail Systems**

- 1) An arrangement of horizontal rails and vertical posts that form a barrier about the work area that is designed and constructed to protect employees from a fall, or falling to a lower level.
  - a) Guard rails systems are not considered complete unless they are comprised of posts, top rails, mid rails and toe boards.
  - b) All guardrail systems installed by HART Engineering shall be complete with toe-boards, and constructed in accordance with the applicable OSHA standards and industry best practices.
  - c) Guardrail system functional requirements (minimum)
    - 1) Rail Heights (above the walking /working level; AW/WL):
      - i. Top Rails: 42-inches, +/- 3-inches
      - ii. Mid-Rails: installed evenly between the Top-Rail and the walking/working level, or at a nominal 21-inches.
      - iii. Toeboards: installed with not more than ¼-inch above
    - 2) Rail Strengths (shall withstand the following without failure):Top Rails: 200 pounds of force applied in any direction, without more than 3” of vertical deflection
      - i. Mid-Rails: 150 pounds of force applied in any direction, without more than 3” of vertical deflection
      - ii. Toeboards: 50 pounds of force applied in any direction, without more than 3” of vertical deflection
    - 3) Guard rail systems must only be constructed of the following materials in

accordance with OSHA's 29 CFR 1926. Subpart M, Appendix B in order to meet or exceed the criteria highlighted in 'c) 1., and c) 2., above;

i. Wood Railings:

1. 2-inch X 4-inch (nominal size) (stress grade) construction grade lumber
2. Posts not spaced more than 8-feet apart (on center)
3. All Top- rails, Mid-rails and Toeboards are to be at least 2-inch x 4-inch (nominal size)

ii. Pipe Railings:

1. 1-1/2-inch (nominal) diameter Schedule 40 steel pipe
2. Posts not spaced more than 8-feet apart (on center)

iii. Structural Steel Railings:

1. 2-inch x 2-inch x 3/8-inch structural angles
2. Posts not spaced more than 8-feet apart (on center)

iv. OTHER MATERIALS:

1. The use of other materials than those specifically listed in this section above (1., 2., 3.) is prohibited without;
  - a. Supporting documentation of material characteristics
  - b. Review of the strength of the supporting and/or mounting surface(s)
  - c. Documentation confirming the installed guardrail system meets or exceeds the prevailing OSHA requirements of 1926.502(b)(3), (4) and (5).
  - d. Express written acknowledgement and concurrence of the HART Companies Corporate Safety Director.

- d) Guard rails must also be fitted with mesh/netting whenever materials could be displaced over a toeboard and fall to a lower level.
- e) Guardrails that are used around holes and other features which are used as points of access (such as ladder ways), shall be fitted with a gate, or be so offset that a person cannot walk directly into the hole or access opening.

**G. BARRICADES AND BARRICADE TAPE PROGRAM**

- a) HART maintains a position that Barricades and Barricade Tapes are use only to provide a visual warning that certain hazards exist, and does not constitute a means of effective 'Fall Protection' (or other protection). Employees must be protected against fall hazards by effective and positive means (such as guardrails). When Tape Barricades must be erected as a visual warning of fall and other worksite hazards to worksite employees, there are three (3) types that will be utilized on this project.

- b) Barricade tape does not offer physical protection for floor edges, roof edges, floor openings, traffic, overhead and other hazards, and shall not be considered as physical protection from such exposures. All forms of barricade tape shall have an ownership form or tag affixed by the subcontractor erecting the barricade.
- c) LISTED BELOW ARE THREE TYPES OF BARRICADE TAPE AND THEIR PROPER USAGE.

a) YELLOW/BLACK - CAUTION

This type of barricade tape shall serve as a caution to indicate to employees that a potential hazard exists. Team members may enter without permission from contractor, as long as they assess the delineated work area for associated hazards. The YELLOW/BLACK - CAUTION barricade tape shall be used for, but not limited to the following:

1. Any indication of 'Caution' regarding workplace hazards
2. Excavations – especially those of less than (4) feet in depth.
3. Identification of trip hazards, low hanging objects, etc.
4. Designated Material Storage Area on or within the worksite.

b) RED - DANGER

This type of barricade tape shall indicate "DANGER" and that potential serious hazards may be present. NO TEAM MEMBER, other than that craft specifically assigned to work inside a RED - DANGER barricade may enter without first obtaining permission from that contractor's work team supervisor. This barricade tape shall be used for, but not limited to the following:

1. Areas Beneath or Adjacent to Overhead Work.
2. Areas containing Health Hazards such as;
  - i. Respiratory
  - ii. Dusts
  - iii. Elevated Noise levels
3. Approaches/Stand-Off Distances to, Perimeters Around Segregated Work Areas
  - i. Live Electrical Components.
  - ii. Exposed steam systems,
  - iii. Abatement envelopes
  - iv. Radiation Surveys.
  - v. System Testing, Pressure Testing, Equipment Start-Up
4. Areas Beneath or Adjacent to Any Scaffolding
  - i. Being erected
  - ii. Being repaired or reconfigured
  - iii. Being demobilized
5. Around swing radius of equipment with a rotating super structure.
6. Around the operational envelope of other running equipment

7. Confined Space Work Area Perimeters
8. Approaches to Controlled Decking Zones
9. Approaches to Controlled Access Zones

c) **MAGENTA (PURPLE)/YELLOW – RADIATION HAZARD**

This type of barricade tape shall be used to indicate “DANGER--RADIATION”, and that related possible exposures may be present.

This barricade tape is to be considered as an equal to red, in that, **NO TEAM MEMBERS ARE ALLOWED TO ENTER THIS AREA** without the express permission of the radiographic work team’s supervisor and the supervisor of their upper-tiered Contractor

1. This MAGENTA (PURPLE)/YELLOW color combination, often with the inclusion of a ‘propeller’ symbol is representative of X-Ray work being performed.
2. Signs must also be posted to protect areas where radiation operations are in progress (see Section 35, Control of Radiation Hazards).
3. Team members are not permitted within the work area delineated by this type of barricade tape, without the benefit of training on;
  - a. Radiation Hazard Awareness
  - b. Exposure Types Involved
  - c. Specific Procedures and Preventative Strategies
  - d. Specific PPE – in addition to the minimum required by
    - i. HART Companies,
    - ii. the project
    - iii. other Authorities Having Jurisdiction.

## **H. BARRICADE ERECTION AND MAINTENANCE**

- a) Each supervisor, foreman or sub-tier contractor supervisor performing work that requires barricade tape to be erected shall:
  1. Erect the tape to enclose the specific area to be protected only.
    - a. Do not block passageways or access ways unless entirely necessary.
    - b. If passageways or access ways must be blocked, contact your general foreman for coordination with site activities and/or possible alternatives.
  2. Erect tape in a secure and neat manner that will maintain a height of between 40” and 45” from the floor or ground surface.
  3. Ensure that an “Barricade Ownership Tag” identifying who placed the tape, when placed and for what hazard, along with contact telephone number.

The only employees allowed to enter any ‘RED – DANGER’ or MAGENTA

(PURPLE)/YELLOW – RADIATION’ barricaded area will be that craft assigned to tasks by that supervisor specifically responsible for the barricade.

**NOTE:** The supervisor responsible for erecting any barricade system, (to include concrete barrier, cones, tape, or others) must maintain the barricade tape during work activity, through task completion. The erecting contractor shall remove the barricade after completion of the work presenting the hazard and the area being cleared of any materials, tools, or other items. When any barricade is to remain in place following the end of any work shift, the erecting contractor’s supervisor is responsible for communicating to the other shifts and/or activities that the barricade must remain in place.

**ATTACHMENT ‘A’ – FALL HAZARD REQUIREMENTS MANAGEMENT  
ATTACHMENT ‘B’ – BARRICADE OWNERSHIP TAG FORM**



**SECTION 15**

**FIRE PREVENTION**

**AND**

**PROTECTION**

**FIRE PREVENTION / PROTECTION**

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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

## **GENERAL**

Employees shall comply with all Fire and Safety rules and regulations established on the project.

### **A. FIRE PREVENTION FOR CONSTRUCTION**

1. Good Housekeeping practices shall be maintained in a continuous and consistent manner throughout all work areas. The accumulation of flammables/combustibles is prohibited.
2. Fire protection equipment will be provided in all areas where flammable/combustible materials are present. Regular inspections will be made by the HART Project Manager and/or the 'Designated Safety Competent Person' to assure that fire extinguishers, hoses, reels and hydrants are in good working order. No unauthorized use of fire hydrants, hose stations and PIV valves will be permitted without authorization from the Safety Department.
3. Clear access to all fire protection equipment will be maintained through the duration of the project. (Includes extinguishers, hose reels, hydrants, mains etc.)
4. Fire protection equipment is to be used only for its intended purpose.
5. All Fire Lanes shall be maintained in a clear condition for Fire Department use.
6. Smoking will be permitted in designated areas only. Violation will be subject to discipline/dismissal.
7. "Strike anywhere" matches are not to be used on the project.

### **B. FLAMMABLE LIQUIDS AND GASES**

1. Only approved Safety containers shall be used for handling, dispensing and storage of flammable/combustible liquids/fuels.
2. Storage of flammable/combustible liquids/fuels shall be only in an approved area and in an approved cabinet or cage.
3. Disposal shall be by a recognized professional hazardous waste handler in accordance with all Federal, State and local regulations.

### **C. CUTTING AND WELDING**

1. The areas of welding and cutting operations (especially below) shall be continually watched during and immediately after the operation.
2. All welding and cutting operations shall have fire extinguishers in the immediate area. Fire extinguishers for this use (stand-by fire watch) are to be checked out of the area tool trailer prior to starting

welding and cuffing operations.

3. Fire blankets are to be used to retain all sparks, slag or hot pieces of metal to prevent contact with a flammable/combustible substance, electrical circuitry, machinery, equipment or people.
4. Practical welding screens are to be used to protect personnel from ultra-violet rays (flash burns).
5. For the elimination of possible fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be shut off. Whenever the torch is not to be used or whenever the torch is left unattended for a substantial time, the torch and hose shall be removed from the confined space. Open ended fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch.

## **D. DEFINITIONS**

### **1. Fire Extinguishers**

#### **a. 2A Extinguisher**

A 2A extinguisher contains water, soda acid or foam, and is of the pump or pressure type with a discharge capacity of not less than 2 gallons per minute.

#### **b. 10 B Extinguisher**

This extinguisher contains foam, CO<sup>2</sup> or a dry chemical with a discharge capacity of not less than 17 gallons or 30 pounds.

#### **c. Halogenated Extinguisher**

Halogen extinguishers contain agents whose vapors have a low toxicity. The decomposition products of these agents can be hazardous. When using halogen extinguishers in unventilated places (such as small rooms, closets, motor vehicles, or other confined spaces), operators and others must avoid breathing the gases produced by thermal decomposition of the agent.

Freon FE 1301 is an example of halogenated agent often used in extinguishers that protect model rooms, computer areas, or similar fixed installations.

### **2. Fire Classifications**

Fires are classified as Class A, B, C, D or Special, depending upon the types of materials involved. These classifications are defined as follows:

- Class A: Fires in ordinary combustible materials such as wood, cloth, paper, trash, rubber and plastic.
- Class B: Fires in flammable liquid, oil, grease, tar, oil-base paint, lacquer and flammable gas.

- Class C: Fires involving energized electrical equipment or systems, resulting in the extinguishing media conducting electricity. (When electrical equipment or systems are de-energized, extinguishers for Class A or B fires can be used safely.)
- Class D: Fires in combustible metals, such as magnesium, titanium, zirconium, sodium, lithium and potassium.
- Special: Fires in certain reactive chemicals that fall outside the other four classifications and that, in some cases, require special extinguishing agents or techniques.

## E. REQUIREMENTS

To prevent ignition hazards, electrical wiring and equipment shall be installed in accordance with the National Electrical Code, NEPA 70-1975.

A fire extinguisher rated not less than 5A shall be provided for each 3,000 square feet of building area and in each yard storage area. Travel distance to any fire extinguisher shall not exceed 75 feet from any protected area inside or outside a building.

One or more extinguishers rated not less than 5A shall be located on each floor of a multi-stored building. At least one 5A-rated extinguisher shall be located adjacent to a stairway in a multi-stored building. Extinguishers rated not less than 10B shall be provided within 50 feet of any area in which more than five (5) gallons of flammable or combustible liquids or five (5) pounds of flammable gas are being used.

The use of tetrachloride extinguishers is prohibited.

Extinguishers shall be conspicuously located where they shall be readily accessible and immediately available in case of fire, and their locations shall be conspicuously marked. Jobsite Fire Extinguishers shall be installed on hangers/posts or in the brackets provided.

## INSPECTIONS

Extinguishers shall be inspected monthly or more often when circumstances warrant, to ensure that they have not been actuated or tampered with, and to detect any damage. Inspection tags shall be placed on them, and the date of inspection shall be indicated after each inspection.

Records should be maintained for one (1) year.

Testing or weighing in accordance with NFPA requirements should include the following:

Type	Frequency
Water Pump	No test required

Cartridge	5 years
Soda Acid	5 years
Pressure	5 years
Foam	5 years
CO <sup>2</sup>	5 years
Dry Chemical	12 years

Each extinguisher shall have a durable tag, securely attached to show the maintenance test and recharge date and the initials or signature of the person who performed the services. A discharged fire extinguisher shall be removed from service immediately and replaced. Documentation of inspections and servicing shall be maintained.

## FLAMMABLE AND COMBUSTIBLE LIQUIDS

### GENERAL

This procedure provides standard methods for handling and storing flammable and combustible liquids.

#### A. DEFINITIONS ~

##### 1. Flammable Liquids

A flammable liquid is any liquid having a flashpoint below 100 Degrees F. Flammable liquids will be known as Class 1 Liquids. Class 1 liquids are divided into three (3) categories as follows:

IA: Liquids having a flashpoint less than 73F and a boiling point below 100 F.

IB: Liquids having a flashpoint less than 73F and a boiling point at or above 100 F.

IC: Liquids having a flashpoint at or above 73F and a boiling point below 100 F.

##### 2. Combustible Liquids

A combustible liquid is any liquid having a flashpoint at or about 100 F. Combustible liquids are divided into two (2) categories as follows:

II: Liquids having a flashpoint above 100F and less than 140F.

III: Liquids having a flashpoint at or above 140F.

Category III liquids are subdivided as follows:

IIIA: Liquids having a flashpoint at or above 140F but below 200F.

IIIB: Liquids having a flashpoint at or above 200F.

##### 3. Safety Can

A safety can is an approved container of not more than five-gallon capacity having a spring-closing lid and spout cover that has been designed so that it will safely relieve internal pressure when subjected to fire exposure.

## **B. STORAGE**

Only approved containers and portable tanks will be used for storage of flammable or combustible liquids. No more than 25 gallons will be stored in a room outside of a storage cabinet. Storage cabinets will be labeled with conspicuous lettering. "FLAMMABLE - KEEP FIRE AWAY." and "NO SMOKING"

Not more than 60 gallons of flammable or 120 gallons of combustible liquids will be stored in any one storage cabinet or container. Not more than three (3) such cabinets may be located in a single storage area. Materials that react with water to create a fire hazard will not be stored with flammable or combustible liquids. Outside portable tank storage will be located no closer than 20 feet to any building. Tanks and dispensing units will be protected against collision damage.

Storage areas will be kept free of weeds, debris, and combustible material not necessary to the storage. Dispensing units will be protected against collision damage. Tanks and containers should be conspicuously marked with the name of the product they contain and "FLAMMABLE KEEP FIRE AWAY." "No SMOKING" signs will be posted in hazardous areas. Approved smoking areas will be designated and properly posted.

Static grounding lines are to be provided for all storage containers

## **C. HANDLING**

Transfer of flammable liquids from one container to another will be done only when containers are electrically interconnected (bonded). Drawing or transferring will be done only through a closed piping system from safety cans by means of a device drawing through the top or by gravity or pump through an approved self-closing valve. Transferring by means of air pressure prohibited.

Dispensing devices and nozzles for flammable liquids will be of the approved type.

Flammable and combustible liquids will not be used within 50 feet of open flame or other source of ignition. "No smoking" signs will be posted in appropriate areas. Flammable and combustible liquids will be kept in closed containers when not actually in use.

## **D. DISPOSAL**

Disposal of flammable and combustible liquids will be in accordance with governing EPA requirements.

## **E. FIRE CONTROL**

At least one (1) portable fire extinguisher having a rating of not less than 20B will be located outside of, but not more than 10 feet from, the door of the room used for storage of more than 60 gallons of liquid. At least one (1) portable fire extinguisher having a rating of not less than

20B will be located not less than 25 feet or more than 75 feet from any flammable liquid storage area.

At least one (1) portable fire extinguisher having a rating of not less than 20B:C will be provided on any vehicle loading, transporting, or dispensing flammable or combustible liquids; in all service and refueling areas; and within 75 feet of each pump or dispenser.

## **'HOT WORK'**

This procedure establishes the safe work practices to be used when performing 'HOT WORK' in a regulated area on the project. 'HOT WORK' is to be defined as any work that uses or generates an open flame, creates heat and/or sparks (such as welding arcs, non-explosion proof tools or equipment, or other heat source capable of causing ignition).

### **TRAINING – NFPA**

**Competent Person must complete Cytiva's Hot Work Permit and submit to their Safety Department for approval prior to the start of all Hot Work**

**ANY HART OR HART SUBCONTRACTOR/SUB-TIER TEAM MEMBER THAT IS INVOLVED IN PLANNING, SCHEDULING, COORDINATING, SUPERVISING, PERFORMING OR SUPPORTING ANY HOT WORK TASKS, MUST COMPLETE 'HOT WORK' TRAINING IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 51b STANDARD, PRIOR TO THE BEGINNING OF ANY OF THE ABOVE 'HOT WORK' ACTIVITIES.**

**ADDITIONAL 'HOT WORK' OR 'HOT WORK'-RELATED TRAINING, PERMITS AND OTHER PERFORMANCE/PROCEDURAL PRECAUTIONS MAY BE REQUIRED BY PREVAILING STATE OR LOCAL AUTHORITIES HAVING JURISDICTION. (LAW)**

**COPIES OF THE CERTIFICATES/CERTIFICATION CARDS, ISSUED BY THE NFPA TO PERSONS COMPLETING NFPA 51b TRAINING AND AUTHORIZED TO PERFORM 'HOT WORK', MUST BE MAINTAINED AT THE PROJECT SITE.**

#### **NOTE:**

- **TRAINING TO FUNCTION AS A 'DEDICATED FIRE WATCH' IN SUPPORT OF 'HOT WORK' IS NOT A SUBSTITUTE PERMITTED IN PLACE OF THE NFPA 51b TRAINING.**
- **'DEDICATED FIRE WATCH' TRAINING (OSHA) IS REQUIRED IN ADDITION TO NFPA 51b.**

**HART Supervisors and Team Members must meet with the project's 'Controlling Entity' (Client/Host, Construction Manager or General Contractor) and**

- **Meet with that organization's Designated Fire Prevention Plan Manager (FPPM).**



- **Review that organization’s Fire Prevention and Protection Plan (FPPP) with the Designated FPPM.**
- **Provide documentation regarding NFPA 51b ‘HOT WORK’ certification(s) and other information to support the project’s NFPA 241 FPPP.**
- **Be informed as to the location of FPPP program documents and related equipment.**
- **Review the project or facility’s ‘IMPAIRMENT LOG’, its purpose, and where it can be accessed within the project for reference during the planning and execution of any ‘HOT WORK’**
- **Review and additional conditions, procedures or other precautions required by any additional Authorities Having Jurisdiction.**

NFPA 51b training, operations supported by an effective NFPA 24 Plan administered by active FPPM, and other industry related training and experience will combine to effectively prevent instances of fire within the worksite. Properly completed ‘HOT WORK’ work plans and permits, with all necessary signatures, must be present prior to the commencement of the work. The ‘HOT WORK’ permit must be posted at the specific work area(s) after review and signatures by all involved personnel. A sample copy of a ‘HOT WORK’ PERMIT form is provided at the end of this section. HART and many clients, and other contractors also have other forms, such as the multiple-part ‘HOT WORK’ PERMIT form FM Global that may be used in lieu of the referenced sample document.

‘HOT WORK’ performed on the premises of this project will be permitted on a daily and task-specific basis by the HART’s Designated Safety Competent Person, and coordinated through the Project’s/Facility’s Designated FPPM. The permit issuer and the respective trades supervisor are responsible for inspecting the area that will contain or be subject to ‘HOT WORK’ and reviewing related hazards and hazard exposures. These identified hazards and/or hazard exposures must be abated before the commencement of any ‘HOT WORK’ operations.

## **GENERAL**

Only employees that have been trained in the safe operations of cutting equipment may use the equipment. Employees that have successfully completed their craft certification test applicable to the use of cuffing and welding equipment will be deemed qualified to use cuffing equipment. Employees must be familiar with sections CFR 1910.254 and 1910.252 (a) (b) and (c).

Operators of equipment should report any equipment defect or safety hazards and discontinue use of equipment until necessary repairs have been made. Only qualified personnel shall make any repairs.

- A. Areas where ‘HOT WORK’, such as welding or burning operations, occurs must be protected to prevent the ignition source from generating a fire.
  - 1) ‘Hot Work’ may only be conducted with Fire Extinguishers in the work area and immediately at hand.
    - a. The contractor and/or crew performing ‘HOT WORK’ must provide their

own Fire Extinguisher(s) in addition to any Fire Extinguishers that may be present within the project/facility work area.

- b. Project/Facility Fire Extinguishers shall not be used by 'HOT WORK' personnel to meet the requirement to have such extinguishers within their work area.
  - c. Project/Facility Fire Extinguishers are strictly for general Fire Protection purposes and many not be accessed for other uses.
- 2) Remove any flammable material or liquid from the area. (No aerosol cans in area)
  - 3) Remove or protect combustibles from sparks and slag. Contain sparks and slag with welding cloth.
  - 3) Proper barriers or screens should be erected to protect others from the arc (flash burn).
  - 4) A twenty (20) pound or larger dry chemical fire extinguisher must be within 20 feet of any welding, burning or flame work.
  - 5) Keep hoses and leads out of walkways. Inspect all leads, grounds, clamps, welding machine hoses, gauges, torches and cylinders each day before use.
  - 6) Avoid breathing fumes. Use exhaust systems, blowers or respirators.
    - a) No welding or burning is to be done on a closed vessel or tank, or any vessel or tank that has not been decontaminated. (This includes drums, barrels, etc.)
  - 7) A designated, non-working, Dedicated Fire Watch must be in-place when 'HOT WORK' is to be performed;
    - a) in locations where other than a minor fire may develop;
    - b) where combustible material stored within 35 ft. of 'HOT WORK';
    - c) combustibles are greater than 35 ft. away but are easily ignited;
    - d) adjacent to wall or floor openings within a 35 ft. radius of combustible material; and
    - e) combustible materials are adjacent to the opposite side of metal partitions, ceilings or roofs.

## **B. "HOT WORK" PERMIT**

Contractors required to perform 'HOT WORK' shall have the 'HOT WORK' requester obtain a blank 'HOT WORK' Permit from the HART Project's Designated Safety Competent Person.

The 'HOT WORK' requester shall complete the Permit and place in the designated Area 'HOT WORK' Permits must be received in the HART Project Trailer Office by 4:00pm on the day prior to requested "Hot Work" activity. Late 'HOT WORK' Permits shall not be accepted~ Contractors are urged to comply with this time to prevent delay in their work.

The HART Project's Designated Safety Competent Person shall review and initial these Permits, retain a copy and return the original/reviewed 'HOT WORK' Permit to the respective Contractor(s).

The Permit requester and/or their designee can retrieve these Permits in the morning before the work shift begins, at the HART Project Trailer Office.

Safety Representatives shall audit 'HOT WORK' activities daily in their respective area using the 'HOT WORK' Permit copy.

If the HART Project's Designated Safety Competent Person determines that the 'HOT WORK' activity does not comply with stated Permit conditions and controls, they then shall direct the working crew to cease their 'Hot Work' and immediately address the matter. The HART Project's Designated Safety Competent Person and the Supervisor of the 'HOT WORK' activity shall determine corrective measures required and undertake actions to correct any deficiencies. Following the initial issuance of a 'HOT WORK' Permit, any corrective actions and/or modification of the conditions under which the 'HOT WORK' Permit was issued shall cause the permit to be invalid. The 'HOT WORK' Trades supervisor and the HART Project's Designated Safety Competent Person shall reauthorize the 'Hot Work' with a new Permit prior to resuming the assigned task.

Supervisors and/or trades contractors performing 'HOT WORK' shall comply with this procedure. Failure by any supervisor or trades sub-contractor to follow the requirements of this section may result in the HART Project Team requiring the Permit Requester of a specific 'HOT WORK' activity to review the activity with the Project's Designated Safety Competent Person, before receiving any authorization to proceed with any further 'HOT WORK'.

Disciplinary Action may also result from any non-compliance with the 'HOT WORK' program.

#### **C. PROTECTIVE CLOTHING**

Protective clothing required for welding and burning varies with the size, nature and location of the work to be performed.

- 1) Fire retardant clothing should be worn as a minimum protective clothing measure.
- 2) All welders shall use flameproof gloves.
- 3) Clothes should be free from oil and grease
- 4) Flameproof leather (or suitable material) aprons should be considered if long-term exposure to radiant heat or sparks is anticipated.

#### **D. WELDING (ELECTRIC)**

- 1) All work must have an effective ground.
- 2) Welding rods are not to be left in the electrode holder when in use. Used welding rod stubs are to be put in metal containers.
- 3) All arcs should be shielded in all construction areas.
- 4) All machines must be turned off at the end of the shift.
- 5) An approved welding helmet must be worn. Equipped with no less than a number ten (10) filter plate, with safety plate on both sides of the filter plate.
- 6) Never perform electric welding from a metal ladder.
- 7) Welders performing gas shielded arc welding must be familiar with the American Welding Society Standard A6-1-1966.

#### **E. BURNING (GAS)**

- 1) Before connecting regulators to cylinders, carefully open the cylinder valve a crack to blow out any foreign particles. After the regulator is connected, stand to one side of gauge while the cylinder valve is opened. Open the cylinder valve slowly. Be certain that the second stage of the regulator is closed before opening the cylinder valve.
- 2) Open valves on fuel gas cylinders (propane, acetylene, natural gas) a quarter turn only. Open oxygen cylinder valves completely. The valve wrench must be kept in place during use.
- 3) Do not exceed 15 psi on the torch side of the gauge when using acetylene.
- 4) When lighting a torch, open the fuel gas valve on the torch before opening the oxygen valve. Use an approved spark lighter.
- 5) All compressed gas cylinders should be kept in bottle-carts when transported or in use.
- 6) All burning rigs must be broken down at the end of the shift, with regulators removed and protective caps secured.
- 7) Compressed-gas cylinders must be secured in a vertical position while in storage, transit or use.
- 8) Keep oil and grease away from oxygen-regulator hose and fittings. Do not store wrenches, dies, cutters or other grease-covered tools in the same compartment with oxygen equipment.
- 9) Do not use compressed gas to clean your clothing, blow out anchor holes, or otherwise clean your work area.
- 10) All hoses, gauges and torches must be inspected regularly.

- 11) Approved burning goggles must be worn. Use at least No. 4 filter with a safety lens on both sides of the filter.
- 12) Never leave a torch in a vessel, tank or other closed container because of the potential hazard of leakage.
- 13) Never use oxygen in pneumatic tools to pressurize a container, to blow out lines, or as
- 14) a substitute for compressed air or other gases.
- 15) Place cylinders and hoses where they are not exposed to sparks and slag from a burning operation.
- 16) Handle cylinders with care, as follows:
  - Lift to upper levels with approved cages only.
  - Do not strike an arc on cylinders.
  - Do not use cylinders as rollers.
  - Do not lift with slings or by the protective cap.
  - Anti-flashback arresters shall be installed on all fuel gas cylinders or built into the regulators.

#### **F. RESPIRATORY PROTECTION**

Proper ventilation and / or respiratory protection shall be provided whenever there is the potential for the build up of hazardous fumes or vapors generated from burning, cutting or welding of lead base metals, exotic metals such as zinc, cadmium, chromium, mercury, beryllium or exotic paints. 'Hot Work' involving exotic metals and or paints to be performed inside confined space requires the approval of the Project Manager.

**ATTACHMENTS - Attachment A: Sample 'HOT WORK' Permit**

# 'HOT WORK' PERMIT'

## ATTACHMENT A

Time 'Hot Work' Allowed: From \_\_\_\_\_ a.m./p.m., To \_\_\_\_\_ a.m./p.m., Date \_\_\_\_\_

Task Description \_\_\_\_\_

Task Worksite Location: \_\_\_\_\_

Type of Work

Electric Welding

( Melting Pot

Chiseling

Person Doing The Work Must Check Items and Sign Below:)

Red Heading	Grinding	
Powder Gun	Brazing	
Hammering	Soldering	
Gas Welding/Burning	Drilling	
Other _____		
Alarms Must Be Cut Off	Yes	No
Cut Off Bldg. Sprinklers	Yes	No
Fire Watch Required	Yes	No
Vapor/Gas Combustion		
Test Required	Yes	No

Special Instructions:

- Hand Fire Extinguisher In Area
- Yes No
- Combustible Materials Removed From Area
- Yes No
- Combustible Materials Removed From Area Below
- Yes No
- Barricades In-Place (Same Level/Lower Level)
- Yes No
- All Flammable Liquids Removed From Area
- Yes No
- All Flammable Gas Shut-Off and isolated
- Yes No
- Welding Screens Positioned Where Needed
- Yes No
- Sheathing Provided Where Needed
- Yes No
- Welding Cables and Hoses Out Of Travel Areas Or Secured At Least 7' Overhead
- Yes No
- All wall and floor openings covered
- Yes No
- Explosive atmosphere in area eliminated
- Yes No
- Dedicated and Trained Fire Watch Personnel In-Place
- Yes No

**NOTE:**

1. Hot Work crews must provide their own Fire Extinguishers. Project Site Extinguishers are not to be used for Hot Work.
2. Hot Work contractor must provide post Hot Work Fire Watch for the duration specified in project/prevaling standards.

**Approval Signatures: (REQUIRED)**

<u>Shift</u>	<u>Supervisor</u>	<u>Foreman</u>	_____
Day	_____	_____	Signature, 'Hot Work' Requestor
Swing	_____	_____	Signature, 'Hot Work' Trade Foreman
Night	_____	_____	Signature, HART Project Superintendent

**SECTION 17**

**CONSTRUCTION**

**EQUIPMENT**



**Powered Industrial Trucks (for Lulls, Telehandlers, Square-Shooters)**

- All powered- industrial trucks shall meet the requirements of design, construction, stability,

inspection, testing, maintenance, and operation defined in ANSI/ASME B56.1.

- All powered-industrial trucks, lift trucks, stackers, and similar equipment shall have the rated capacity posted on the vehicle so as to be clearly visible to the operator. When the manufacturer provides auxiliary removable counterweights, corresponding alternate rated capacities also shall be clearly shown on the vehicle. The ratings shall not be exceeded.
- Only trained and authorized operators shall be permitted to operate a powered -industrial truck. ;
  - Training must consist of classroom, practical operation of the same type of truck the student uses on the job, and a Demonstrated Skills Evaluation.
  - Training shall be provided in accordance with OSHA Standard 29 CFR 1910.178.
  - The employer must certify that the operator has been trained and evaluated as required by the standard.
  - The certification shall include the name of the operator, and
  - The name of the person(s) performing the training and/or evaluation.
  - Operator Certification Renewal shall be conducted every two years.
  - Refresher training shall be provided as otherwise indicated by the standard.
- When a powered-industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes shall be set. Wheels shall be blocked if the truck is parked on an incline. Any running equipment is considered unattended when;
  - The operator is not within 25-feet of the machine's control station
  - The operator is within 25-feet of the equipment, but does not have a direct 'Line of Sight' to the machine.
  - The Operator is within 25-feet of the equipment, but does not have direct access to the control station.
- An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.
- Dock boards or bridge plates shall be properly secured before being driven over. Dock board or bridge plates shall be driven over carefully, slowly and their rated capacity shall not be exceeded.
- Under all travel conditions the powered-industrial truck shall be operated at a speed that will permit it to be brought to a stop in a safe manner.
- On all grades the load and load engaging means shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.
- When ascending or descending grades in excess of 10%, loaded powered-industrial trucks shall be driven with the load upgrade.
- The controls of loaders, excavators, or similar equipment with folding booms or lift arms shall not be operated from a ground position unless so designed.

- Personnel shall not work in, pass under, or ride in the buckets or booms of loaders in operation.
- Tire service vehicles shall be operated so that the operator will be clear of tires and rims when hoisting operations are being performed.
  - o Tires large enough to require hoisting equipment must be secured from movement by the continued support of the hoisting equipment, unless bolted to the vehicle hub or otherwise restrained.
- All mobile, heavy equipment and other machinery, including bulldozer, scraper, dragline, crane, motor grader, front-end loader, mechanical shovel, backhoe, rack trucks and other similar equipment/vehicles must be equipped with at least one dry chemical or CO2 fire extinguisher with a minimum rating of 5 -B:C.
- Fill hatches on water haul vehicles shall be secured or the opening reduced to a maximum of 8 in (20.3 cm).

## **GUARDING AND SAFETY DEVICES**

### **Reverse motion signal (back- up) alarm.**

- All vehicles and self -propelled construction, heavy or mobile industrial equipment, whether operating alone or in combination within the worksite, shall be equipped with a reverse motion signal or alarm.
- Equipment designed and operated so that the operator is always facing the direction of motion does not require a reverse signal alarm.
- Reverse signal alarms shall be audible and sufficiently distinct to be heard under prevailing conditions.
- Alarms shall operate automatically upon commencement of backward motion. Alarms may be continuous or intermittent (not to exceed 3-second intervals) and shall operate during the entire backward movement.
- Reverse signal alarms shall be in addition to any requirements for traffic control persons, flaggers and/or spotters.
- A warning device or traffic control person shall be provided where there is danger to team members from moving equipment, swinging loads, buckets, booms, etc.

***NO PERSON SHALL DISABLE ANY REVERSE MOTION OR OTHER WARNING DEVICE.***

***DISABLING ANY SAFETY DEVICE OR SAFETY FEATURE ON ANY EQUIPMENT IS GROUNDS FOR IMMEDIATE DISMISSAL FROM THE WORKFORCE.***

### **Guarding**

- All belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts of equipment shall be guarded when exposed to contact by persons or when they otherwise create a hazard.
- All hot surfaces of equipment, including exhaust pipes or other lines, shall be guarded or insulated to prevent injury and fire.

- All equipment having a charging skip shall be provided with guards on both sides and open end of the skip area to prevent persons from walking under the skip while it is elevated.
- Platforms, foot walks, steps, handholds, guardrails, and toe boards shall be designed, constructed, and installed on machinery and equipment to provide safe footing and access ways.
- Equipment shall be provided with suitable working surfaces of platforms, guard rails, and hand grabs when attendants or other employees are required to ride for operating purposes outside the operator's cab or compartment.
- Equipment decks, working platforms, skips and steps must feature be of nonskid surfaces.
- Substantial overhead protection shall be provided for the operators of forklifts and similar material handling equipment.
- Fuel tanks shall be located in a manner that will not allow spills or overflows to run onto engine, exhaust, or electrical equipment.
- Exhaust or discharges from equipment shall be so directed that they do not endanger persons or obstruct the view of the operator.
- A safety tire rack, cage, or equivalent protection shall be provided and used when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings of similar devices.
- No guard, safety appliance, or device shall be removed from machinery or equipment, or made ineffective, except for making immediate repairs, lubrications, or adjustments, and then only after the power has been shut off.
  - o All guards and devices shall be replaced immediately after completion of repairs and adjustments and before power is turned on.
- Seatbelts and anchorages meeting the requirements of 49 CFR 571 shall be installed and worn in all motor vehicles (installation and usage on buses is optional). Two -piece seat belts and anchorages for construction equipment shall comply with applicable Federal specifications or Society of Automotive Engineers (SAE) Standard J386.
- All high-rider industrial trucks shall be equipped with overhead guards that meet the structural requirements defined in paragraph 4.21 of ANSI/A SME B56.1.
- Suitable protection against the elements, falling or flying objects, swinging loads, and similar hazards shall be provided for operators of all machinery or equipment.
- Glass used in windshields, passenger compartments or cab enclosures shall be safety glass.

### **FOPS Systems – Falling Object Protective Structure**

- All bulldozers, tractors, or similar equipment used in clearing operations shall be provided with guards, canopies, or grills to protect the operator from falling and flying objects as appropriate to the nature of the clearing operations.
- FOPS for other construction, industrial, and grounds-keeping equipment will be furnished when the operator is exposed to falling object hazards.

- FOPS will be certified by the manufacturer or a licensed engineer as complying with the applicable recommended practices of SAE Standards J231 and J1043.

### **ROPS Systems – Rollover Protective Structures**

In addition to the requirements of 16.B.08 and 16.B.11, seat belts and ROPS shall be installed on:

- Crawler and rubber-tire tractors including dozers, push /pull tractors, winch tractors, and mowers;
- Off- the - highway self-propelled pneumatic-tire earth movers such as trucks, pans, scrapers, bottom dumps, and end dumps;  
Motor graders;
- Water tank trucks having a tank height less than the cab; and
- Other self-propelled construction equipment such as front-end loaders, backhoes, rollers, and compactors
- ROPS are not required on;
  - Trucks designed for hauling on public highways;
  - Crane - mounted dragline backhoes;
  - Sections of rollers and compactors of the tandem steel- wheeled and self-propelled pneumatic tired type that do not have an operator's station;
  - Self-propelled, rubber -tired lawn and garden tractors and side boom pipe laying tractors operated solely on flat terrain (maximum 10 slope; 20 slope permitted when off- loading from a truck) not exposed to rollover hazards; and cranes, draglines, or equipment on which the operator's cab and boom rotate as a unit.
- ROPS may be removed from certain types of equipment when
  - o the work cannot be performed with the ROPS in place and when ROPS removal is justified and delineated in a JHA/AHA and
  - o accepted in writing by the HART Corporate Safety Director.
- The operating authority shall furnish proof from the manufacturer or certification from a licensed engineer that the ROPS complies with SAE Standards J167, J1040, J1042, J1084, and J1194, as applicable.
- ROPS shall also be acceptable if they meet the criteria of any State that has a Department of Labor approved OSHA program or meet Water and Power Resources Service requirements.
- The following information permanently affixed to the ROPS is acceptable in lieu of a written certification:
  - Manufacturer’s or fabricator's name and address;
  - ROPS model number, if any; and Machine make, model, or series number that the structure is designed to fit.
- Field welding on ROPS shall be performed by welders who are certified by the contractor as qualified in accordance with ANSI/ AWS D1.1, or the equivalent.
- All points requiring lubrication during operation shall have fittings so located or guarded to be

accessible without hazardous exposure.

- All machinery or equipment and material hoists operating on rails, tracks, or trolleys shall have positive stops or limiting devices either on the equipment, rails, tracks, or trolleys to prevent overrunning safe limits.
- Under the following circumstances, long-bed end-dump trailers used in off -road hauling should be equipped with a roll-over warning device;
  - The device should have a continuous monitoring display at the operator station to give the operator a quick and easily read indicator and audible warning of an unsafe condition.
  - The material being dumped is subject to being stuck or caught in the trailer rather than exiting the bed freely, and
  - The dumpsite cannot be maintained in a nominally level condition (lateral slope less than 1 - 2 degrees).

## **MOTOR VEHICLES**

- Every person operating a motor vehicle shall possess, at all times while operating such a vehicle, a license/permit valid for the type of equipment, or vehicle, being operated. The operator must present the license/permit to the HART project representative upon request. Project requirements may necessitate the copying of such a document for project record. Failure to comply with such requests may result in the immediate shutdown of the vehicle involved and removal of the operator from the project. At all times the operators of motor vehicles shall:
  - Ensure seat belts are worn.
  - Practice the principles of defensive driving
  - Have the vehicle under control
  - Be able to bring it to a complete stop within a safe driving distance.
- Prior to initial use, all work or project related motor vehicles, unless those documented as inspected by State or Local authorities, are subject to an inspection by a qualified mechanic and to be found in safe operating condition.
  - The inspection shall be documented in writing and available for review by HART and/or its client representatives.
- All motor vehicles shall;
  - Be inspected on a scheduled maintenance program.
  - Be Checked daily, prior to use, by the operator to assure that the following parts, equipment and accessories are in safe operating condition and free of apparent damage that could cause failure while in use:
    - Service Brakes, including trailer brake connections;
    - Parking System (Hand Brake)
    - Emergency Stopping System (brakes)
    - Tires

- Horns
  - Steering mechanism
  - Coupling devices
  - Seat belts
  - Operating Controls
  - Accessories (includes the following)
    - o Lights, Reflectors
    - o Windshield Wipers
    - o Operable speedometer
    - o Operable Fuel Gauge
    - o Defrosters (if necessary)
  - Have functioning “back-up” or reverse-motion alarms
  - Have mirrors are to be complete and free of cracks
  - Have all window and door safety glass intact
  - Damaged glass must be properly repaired or replaced
  - Have non-slip surfaces on steps.
  - Have one charged and inspected 5-lb fire extinguisher
- Local traffic regulations apply to project vehicles whenever they may be using roadways adjacent to the work site:
- All off-road vehicles shall be transported using proper transit plates.
  - All passengers are to be seated during movement of the vehicle.
  - All operators and passengers of motor vehicles shall wear seat belts/safety restraints as provided by the manufacturer.
  - Motor vehicles shall not be allowed in areas so designated by the owner/client.

## **SECTION 17**

# **PROJECT SPECIFIC ACTIVITIES CONSTRUCTION EQUIPMENT - SAFE WORK PRACTICES -**



## **POWDER ACTUATED TOOLS**

Explosive actuated tools are sometimes referred to as powder actuated drivers, ramset tools or stud gun. It is a tool that depends on an explosive charge to provide the driving force. It is used for driving studs, pins

or other fastening devices into materials or surfaces or for operations of a similar nature. Use of this type of tool is permitted as long as the following guidelines are followed closely.

1. Only certified team members that have been ‘appropriately trained and qualified’ are permitted to use any ‘Powder Actuated Tool(s).
  - a. A certified team member one that has
    - i. been formally instructed and trained by the manufacturer or manufacturer’s representative.
    - ii. Completed a ‘Demonstrated Skills Evaluation’ with a qualified evaluator provided by one of the following;
      1. the specific tool manufacturer,
      2. the specific tool manufacturer’s designated representative, or
      3. other person that has knowledge and demonstrated competencies in;
        - a. the proper and efficient operation of the tool(s),
        - b. the application(s) within the worksite or evaluated team members’ scope of tasks
    - iii. Possesses (documented) credentials confirming the completion of education, demonstrated skills evaluations and authorizations operate specific tools in the performance of the related work tasks.
  - b. Certified team members must have their credential documentation (as provided by the training and evaluating activities, with the authorization endorsement by their respective employer) upon their person while they are performing work with their specific powder actuated tools.
2. Personal Protective Equipment (PPE); head protection, eye protection, hearing protection, face protection is required as a minimum, with additional PPE, procedures, practices and other recommendations and suggestion as instructed by the tools original equipment manufacturer.
  - a. Minimum eye protection is considered as the combination of face shield and safety glasses/goggles worn in conjunction with a hard hat for head protection.
  - b. Face shields and safety glasses/goggles must be ANSI Z87.1+ compliant.
3. PPE as reviewed in item 2 (above) is also a work practice requirement for all other team members working within and immediately adjacent to the area(s) where powder actuated tools are in use.
4. Only indirect acting powder actuated tools may be used.
  - a. Tools designed using a plunger or piston to propel fasteners are acceptable.
  - b. Tools designed to have the charge directly propel the fastener are prohibited.
5. Tool must be designed so that it will not fire if the muzzle is not in firm contact with the surface to be worked on.
6. Shields or guards required by the manufacturer to confine flying particles and prevent the escape of ricocheting studs and pins must be used as prescribed by the owner’s manual.
7. Tool must be provided with a safety lock designed to “fail safe”; a condition in which if the safety lock is broken, worn or damaged in any manner the tool will not fire.
8. Users of the device must follow manufacturer’s recommendations as to size of charge, stud unit

- or pin for specific application.
9. Loaded tools are not to be left unattended.
  10. Cartridges or shells must be kept in their original containers or in a rigid protective container.
    - a. Storing any cartridges or shells within the tool's carrying case is prohibited.
    - b. Cartridges or shells must not be carried loose in clothing.
  11. Tools, shots and cartridges not in use are to be stored in a locked container.
  12. Each tool should be tested each day before loading to see that all safety devices are in good serviceable working condition.
  12. Tool should be loaded just prior to use. Never leave a loaded tool unattended.
  13. Explosive activated tools should be handled like firearms, with hands clear of muzzle and barrel pointed away from all persons.
  14. MISFIRES:
    - a. In the event of a "misfire", continue to hold the tool's muzzle firmly against the work surface for no less than 30 seconds.
    - b. Great care must then be taken to keep the muzzle aimed away from team members in the area when
      - i. the tool's barrel is removed or
      - ii. the tool's receiver/action is opened to eject the cartridge.
  15. Routine inspections should be done periodically of all safety devices, as well as the tool's receiver/action and working mechanism(s).
  16. Worn or defective tools should be returned for repair immediately.
  17. Never store the tool loaded. Store tool with the barrel removed or breach open.
  18. Before actual use of this tool, appropriate supervisory team members must be notified of intended use.
  19. Attachment of fasteners to the following materials is prohibited. Hard or brittle materials such as cast iron, glazed tile, surface hardened steel, glass block, face brick, hollow tile, or any spalled surface.
  20. Materials that are easily penetrated should be backed by a substance that will prevent the pin or stud from passing completely through.
  21. Fasteners must not be driven into brick or concrete closer than 3" from an edge or corner, or into steel surfaces closer than 1/2" from the edge or corner unless a special guard, jig, or fixture is used to cover all avenues through which flying particles could escape.
  22. Never drive a fastener into any operating vessel.
  23. Never use a power impact tool unless the retainer ring or pin is in place and the tool or plunger is against a solid object to prevent it from being thrown out.

## **COMPRESSED GAS AND OXYGEN CYLINDERS**

This section provides guidance for the protection of team members performing their work with the use of, compressed gas cylinders. This is also intended to help team members related hazards while they are

working in or adjacent to areas, compress gas cylinders are in use or being stored.

1. MARKING: All cylinders shall be clearly marked in a manner that identifies its contents.
2. **Transporting and Moving Cylinders:**
  - a. When compressed gas cylinders are hoisted, they will be secured on a cradle, cylinder truck, or rack designed to be rigged for lifting.
  - b. The use of choker slings for the purpose of hoisting cylinders is prohibited.
  - c. When cylinders are moved with powered vehicles, they will be secured in a vertical position.
  - d. Unless cylinders are firmly secured on a cylinder truck, regulators will be removed and valve protection caps put in place before cylinders are moved in any fashion or by any means.
  - e. Whenever cylinders are moved, the valve will be in a closed position.
3. **Placing Cylinders:**
  - a. Cylinders will be secured in an upright position, except when being hoisted or moved.
  - b. Cylinders will be placed where they cannot become part of an electrical circuit and will be kept away from piping systems and layout tables that may be used for grounding electrical circuits.
  - c. When cylinders are in use, they will be placed with the valve end up, and secured with chain to prevent them from being knocked over.
  - d. Cylinders will not be placed where they will be exposed to open flames, hot metal, or other sources of heat.
  - e. Cylinders containing acetylene, propane, butane or oxygen will not be placed in any confined area.
4. **Storing Cylinders:**
  - a. Signs will be posted at storage areas indicating the contents of the cylinders.
  - b. "NO SMOKING" signs will be posted at cylinder storage areas.
  - c. Cylinders, if stored on a rack, will be stored on a rack with sound flooring.
  - d. **ACETELYENE CYLINDERS MUST ONLY BE STORED IN AN UPRIGHT MANNER!**
  - e. Cylinders, cylinder valves and related apparatus will be kept free from oily or greasy substances.
  - f. Cylinders will be stored away from sources of heat.
  - g. Oxygen cylinders in storage will be separated from fuel gas cylinders or combustible materials (especially oil or grease) by a minimum distance of 20 feet or by a noncombustible barrier at least five feet high having a fire-resistant rating

of at least 30-minutes.

- h. [Note: Jobsite trailers are evaluated by the manufacturer and are typically rated at only 20 minutes duration.]
  - i. Oxygen cylinders shall be stored in a secure area.
  - j. Empty cylinders will be stored with the valves closed and capped.
  - k. Empty cylinders will be marked and separated from full cylinders.
5. **Using Cylinders:**
- a. Cylinders must not be dropped or roughly handled.
  - b. Before connecting a regulator to the valve, the valve will be “cracked” - a practice in which the valve is opened slowly and closed immediately.
  - c. Valve “cracking” or clearing will be done in an area that is free of possible ignition sources. During this process, the trades team member shall stand to one side of the valve/cylinder.
  - d. Safety devices will not be tampered with.
  - e. Leaking or defective cylinders shall not be used.
  - f. Cylinders found to be leaking, or otherwise defective, shall be secured, and reported to supervision for safe removal removed from the work site.
6. **Refilling Gas Cylinders:**
- a. No one except the owner of the cylinder or a person authorized by that specific owner will refill a cylinder.

## **RIGGING**

### **1. SCOPE**

This section provides guidance on the use of rigging components and practices, and the team member education requirements for each team member that must use rigging equipment to accomplish related work tasks. This section includes all rigging equipment components including, but not limited to: slings, ‘chokers’, multiple-leg bridles, wire rope lashing, come-a-longs, chain falls and/or chain hoists, rigging hardware, and below the hook lifting devices.

### **2. Certification**

- a. The manufacturer’s information/certification is to be maintained for all rigging on the project.

### 3. **Training\**

- a. Any team members that must use rigging equipment to perform assigned work tasks;
  - i. Must have completed documented training by their employer in proper rigging selection, techniques, inspection, use and maintenance, as required by the OSHA and ANSI standards.
  - ii. Provide copies of training documents/certifications/qualifications to the project office.
- b. Only appropriately trained team members shall be permitted to rig/prepare any loads for hoisting
- c. At least one team member in each rigging crew must have documented training as a 'Qualified Rigger'.as delineated in the OSHA and ANSI standards.
- d. The 'Qualified Rigger' of record as assigned to lead any particular rigging activity shall have the appropriate level of education and qualifications as appropriate to solve or resolve problems related to the complexity of the task;
  - i. Qualified Rigger (Basic)
  - ii. Advanced/Master Rigger
- e. Rigger credentials/qualifications must be renewed within a period of time not exceeding three-years from the initial date of confirmed/certified completion.

### 4. **Inspection**

- a. All rigging that is located and/or in use at the worksite must be entered into the project's Rigging Log. The Rigging Log must be used to;
  - i. Record initial inspections on all rigging delivered to, or received by the worksite.
  - ii. Record all periodic inspections of all rigging components as required in the prevailing OSHA and ANSI standards
  - iii. Record all instances of the removal from service, repair and/or other actions regarding damaged/defective/or otherwise deficient rigging component.
  - iv. A copy of the Rigging Log is provided as ATTACHMENT A at the end of the Rigging chapter.
- b. All rigging is inspected daily, and immediately prior to use on each shift.
- c. All rigging must be inspected after use, prior to being returned to storage.
- d. Manufacturers requirements, suggestions, recommendations and directions must be followed regarding;
  - i. Proper application of the rigging equipment component(s)
  - ii. Limitations on use/service
  - iii. Inspection frequencies
  - iv. Storage
  - v. Maintenance and Care
- e. All rigging components should feature an inspection/service tag that confirms the capacity of the item, including that of any alternate configuration.

- f. The Project Supervisor or designated ‘Rigging Competent Person’ will ensure that any rigging equipment/component found to be defective is immediately removed from service.
- g. Any damaged, defective or otherwise deficient rigging equipment components must be;
  - i. Tagged Out of Service, “**DO NOT USE**,”
  - ii. Segregated from the worksite and secured to prevent unintentional use/re-use, and
  - iii. Destroyed, or
  - iv. Returned to the HART Corporate office for further review and repair or destruction as appropriate.
- h. All rigging equipment inspected and found to be in good, sound and serviceable condition shall be color coded for the monthly period, and valid for that period only.
- i. The color code scheme and placement of color code marking for rigging equipment on HART projects is identical to that delineated in the HART Assured Grounding Program.

## **5. Safe Work Practices and Other Requirements**

- a. Rigging and lashing should be protected from damage by softeners or other active means while in place.
- b. Any slings or other rigging equipment components that may subject to damage by sharp edges or other hazards shall be protected by means of softeners prior to the lift.
- c. The chains or ropes of a chain hoists (to include ‘come-alongs’ or ‘chain-falls’) shall not be used as chokers.
- d. Lifting bays (work areas of ‘lift’ and ‘set’) must be effectively barricaded at every related level/working elevation necessary to protect team members from walking beneath any loads.
- e. Buckets, barrels, tubs, scale pans etc. used to lift smaller objects shall be effectively covered and secured during lifting to prevent accidental spillage of their contents.
- f. Scale Pans, Spreader-bars, Lifting Beams, and other ‘Below The Hook’ lifting/material handling devices that are used to hoist any materials, debris or other items, must be fitted with a manufacturer’s tag or data plate that denotes its own weight and lifting capacity. Such containers not featured with this nomenclature shall not be used, and must be immediately removed from the HART project site.
- g. Sheet metal, boiler siding, insulation or other sheet materials will not be lifted with sheet dogs without the prior written approval of the HART Project Manager and Corporate Safety Director.
- h. Rigging equipment components must not be subject to prevailing environmental conditions longer than necessary to do the work. Rigging components must be properly stored and protected from weather and other prevailing exposures to hazards and/or damage.
- i. Rigging equipment components found to be defective, exhibiting signs of significant wear or displaying other indications of damage, shall immediately be removed from service and destroyed.





## ATTACHMENT 'A' - RIGGING EQUIPMENT INSPECTION REPORT

MONTH		MARKING/COLOR CODE	AREA				CREW														
<b>INSTRUCTIONS:</b> 1. Entire length and attachments are to be checked for excessive wear and damage. 2. This √ symbol indicates inspection is satisfactory. This x symbol indicates equipment is defective. 3. Forward Report to Project Safety Department					BROKEN WIRES	REDUCTION IN DIAMETER DUE TO WEAR	KINKING, CRUSHING, BIRD CAGING	HEAT, MECHANICAL OR CHEMICAL DAMAGE	END ATTACHED CRACKED, DEFORMED OR	HOOK SPREAD OR TWIST	BROKEN OR WORN STICHES	WEAR OR ELONGATION OF LINKS	BRAKES, CLUTCH OR LOCKING DEVICE								
Type of Equipment	Date Inspected	Equipment Serial Number																			
REMARKS ON CORRECTIVE ACTION TAKEN ON DEFECTS (INDICATE LINE NUMBER REFERRED TO):																					
INSPECTED BY:								DATE													

**MASONRY CONSTRUCTION**

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**HART ENGINEERING CORPORATION  
Project Safety Manual**

This section provides guidelines for the protection of team members involved in the performance of masonry construction tasks.

### **1. GENERAL REQUIREMENTS**

- a. A 'Controlled Access Zone' must be established and effectively barricaded whenever a masonry wall is being constructed. The limited access zone shall be;
  - i. established prior to the start of construction of the any masonry wall;
  - ii. equal to the height of the wall to be constructed, plus 4 feet,
  - iii. run the entire length of the wall, and
  - iv. established on the side of the wall which will does not feature a scaffold.
- b. Only team members actively engaged in the construction of the wall will be permitted to enter, and/or work, within the barricaded 'Controlled Access Zone.'
- c. This barricade will remain in place until the wall is fully and effectively supported and/or braced in accordance with project documents, industry 'best practices' and prevailing/applicable standards.
- d. Masonry walls eight (8) feet high or greater, must be effectively braced to prevent overturning and collapse.
  - i. The bracing must remain in place until permanent supports are in place.
  - ii. Approved bracing techniques, plans and methods shall be provided by the subcontractor erecting any masonry wall/masonry construction, to the HART Project Manager for review and approval prior to their worksite mobilization.

### **GENERAL TRADES WORK (Framing, Drywall and other Finishes)**

This section provides information concerning the steps involved in, certain General Trades work tasks. This includes the hazards and associated control methods for installation of framing, drywall and other finishes.

#### **1. GENERAL TRADES WORK INCLUDES:**

- a. ACTIVITIES AND WORK TASKS
  - i. Loading material
  - ii. Installation of Temporary Walls/Partitions
  - iii. Utilizing Rolling Scaffolds
  - iv. Operating Mobile Elevated Lifts
  - v. Operating 'Chop' saws
  - vi. Operating Lasers
  - vii. Erecting Tubular Welded Frame Scaffolding
  - viii. Installing Shaft Wall
  
  - ix. Taping and Sanding
  - x. Cleanup
  - xi. Door Frame Installation

- xii. Installing Wood Blocking
  - xiii. Applying Spray Firestopping
  - xiv. Mixing Joint Compound
  - xv. Application of Wire Lathe and Plastering
- b. ASSOCIATED HAZARDS with these activities include, but are not limited to:
- i. Cuts from sharp edges or from use of snips
  - ii. Pinches from clamps, friction locks, and adjustable components/tools
  - iii. Debris in eyes from cutting
  - iv. Loss of hearing from abrasive blade saws
  - v. Respiratory damage
  - vi. Skin irritation
  - vii. Falls from scaffold platforms
  - viii. Burns from abrasive saw sparks
  - ix. Muscle strains from lifting
  - x. Slips/trips/falls from electrical cords, hoses, debris and/or other material(s)
  - xi. Electric Shock, Electrocution
  - xii. 'Struck by' material handling operations, falling materials/debris, moving equipment
  - xiii. Explosions, struck by projectiles
  - xiv. Laser use hazards to the eyes
- c. Recommended procedures to control these hazards include:
- i. Hand Protection: Wear ANSI Cut-Level 3 rated gloves as a minimum.
  - ii. Head Protection: Wear an ANSI rated hard hat. 'Bump Caps' are not permitted.
  - iii. Eye Protection: Wear 'ANSI Z87.1+' compliant safety glasses, goggles and face shields.
  - iv. Wear hearing protection, safety glasses, face shield when using abrasive blade saw
  - v. Eye Protection: Wear laser safety glasses and post signage for laser use
  - vi. Lock wheels prior to mounting mobile staging
  - vii. Ensure all scaffolding erected by competent persons, inspected and has a completed Scaffold Tag.
  - viii. Guardrails systems, complete with toe boards, are installed on all open sides and edges of work areas above lower working/walking levels, scaffolds and other elevated work platforms.
  - ix. Personal fall arrest (harness/lanyards with shock absorbers) secured to an anchorage point (5,000 lb. capacity per person) to be worn when hoisting or working near unguarded floor edges and shafts
  - x. Proper lifting techniques, dollies, lifts, jacks used to hoist drywall

- xi. Scaffolds and lifts to be inspected daily by competent person
- xii. Secure wheels to mobile scaffolding prior to climbing and working.
- xiii. Mobile scaffolds must be moved from the floor level, with team members dismount prior to relocation.
- xiv. Lift operators shall be trained by manufacturer rep.
- xv. Powder-actuated tool operators shall be trained and possess training certificate of tool they are using.
- xvi. Powder-actuated tool loads shall be locked up and with charges properly disposed of when spent.
- xvii. Ensure power is disconnected before servicing or adjusting any equipment.
- xviii. Ground fault circuit interrupters shall be used at all times.
  - 1. GFCI directly connected to the source of electrical power.
- xix. Electrical extension and power tool cords sets must be inspected at least at the beginning of each shift/prior to use.
- xx. Damaged electrical extension cords and power tool cords shall be replaced, repaired or destroyed.
- xxi. Repaired electrical cords and power tool cord sets must be tested prior to being returned to service.
- xxii. Electrical extension cords shall be run overhead or curbed to wall.
- xxiii. Barricades must be erected and maintained around hoisting operations and material handling equipment. Reinforce the barricade(s) with ‘spotter’ team members, to as a precaution against unauthorized access of these work areas by ‘non-essential’ team members or ‘uninvolved’ personnel.
- xxiv. Safety Data Sheets (SDS) sheets and product labels shall be submitted and reviewed prior to the commencement of any work in this section.
  - 1. Any manufacturer’s PPE and ventilation requirements shall be followed for products containing chemicals/compounds identified as hazardous to team members.
- xxv. Provide for adequate direction or exhaust ventilation or use vacuum-connected equipment.
- xxvi. Proper ladder access to all scaffolding and working platforms must be provided, with ladders extending 3’ above platform, and secured in place.
- xxvii. Scaffold systems, pre-manufactured or otherwise, shall be fitted with a self-closing gate or ‘90-degree offset entry’ at platform access points.
- xxviii. Team members are not permitted to climb on, over or through any scaffold bracing.
- xxix. Guardrails systems, complete with toeboards, must be effectively raised and fitted with additional rails and bracing, if team members use stilts or ladders near wall or floor openings.

xxx. When ladders are used near a fall hazard exposure, the ladder shall be located no closer the hazard than its own height. (i.e., a six-foot ladder is must be located no closer than six feet from the protective guardrail or other identified fall risk.)

## **SECTION 18**

# **SYSTEM TESTING AND CONTROL**

1. SYSTEM AND EQUIPMENT TEST AREA CONTROL PROCEDURE



1.1. Objective

- A. To classify and provide a definition for the type of system and equipment test that will be conducted at various locations on the project. Determine the level of control required to safely execute the testing of the equipment or systems and to assign responsibilities.

**NOTE:**

**This section must be reviewed along with any other prevailing test requirements specified by the project requirements, design agent of record and any other authority having jurisdiction. Test requirements must be reviewed to ensure the highest level of protection for any team member.**

1.2. Definition – Class One Test

1. Class One Test

Any test that involves multiple work areas or elevations that team members are performing work activities in and due to the nature of the hazards associated with the:

1. Test pressure, media, voltage and / or mechanical movement of parts;
2. Release of test media, accidental contact; and the event of mechanical failure of the equipment, and
3. Potential to cause serious injury, death or significant property or equipment damage.

2. Class One Test Requirements

The respective discipline manager and/or the system's installing subcontractor will communicate the intent to conduct a Class One Test 48 hrs in advance to all managing authorities that could be affected.

1. A pretest meeting of involved managers will be conducted to:
  - a. Review the potential hazards associated with the test;
  - b. Establish safe distances of boundaries to be maintained;
  - c. Identify the quantity of signs (Danger Test In Progress) required and additional means i.e., barricades, cones, etc. to identify boundaries;
  - d. Identify the number of, name of, and post positions for individuals required to insure visually the integrity of the established boundaries. Boundaries are to be maintained for the duration of the test. Relief individuals may need to be identified;
  - e. Identify the means that post position individuals will alert (i.e., air horn, whistle) anyone coming to close to or crossing established boundaries;
  - f. Identify means i.e., radio that post position individuals can communicate that unauthorized personnel did not heed

warning or a problem with the test is observed by individuals assigned to post positions;

- g. Establish means of identifying individuals authorized to enter test area;
  - h. Establish safe areas for nonparticipating visitors, spectators, photographers; and
  - i. Identify and prepare any emergency services that may be required at test area.
- 2. Prior to commencement of the test a STA meeting will be conducted with individuals participating in the test activities to identify roles and responsibilities.
  - 3. Prior to commencement of the test the Site Safety Manager will conduct an inspection of the application of the plan. Any deviations will be corrected before the test may commence.

1.3. Definition – Class Two Test

A. Class Two Test: Any test confined to a specific area that team members are performing work activities and due to the nature of the hazards associated with the:

- 1. Test pressure, media, voltage, and/or mechanical movement of parts;
- 2. Release of test media, accidental contact; and the event of mechanical failure of the equipment, and
- 3. Potential to cause serious injury, death or significant property or equipment damage.

B. Class Two Test Requirements

The respective discipline manager will communicate the intent to conduct a Class Two Test 24 hrs in advance to all managing authorities that could be effected.

- 1. The Test Coordinator and Safety Personnel will conduct a Pre-Test meeting to:
  - a. Review the potential hazards associated with the test;
  - b. Establish safe distances of boundaries to be maintained;
  - c. Identify the quantity of signs (Danger Test In Progress ) required and additional means i.e., barricades, cones, etc. required to identify boundaries.
  - d. Identify the number of, name of, and post positions for individuals required to insure visually the integrity of the established boundaries. Boundaries are to be maintained for the duration of the test. Relief individuals may need to be identified.
  - e. Identify the means that post position individuals will alert (i.e., air horn, whistle) anyone coming to close to or crossing established boundaries.
  - f. Identify means i.e., radio that post position individuals can communicate that unauthorized personnel did not heed warning or a problem with the test is observed by individuals assigned to post positions.

- g. Establish means of identifying individuals authorized to enter test area;
  - h. Establish safe areas for nonparticipating visitors, spectators, photographers;
  - i. Identify any emergency services that may be required at test area.
3. Prior to commencement of the test a STA meeting will be conducted with individuals participating in the test activities to identify roles and responsibilities.
  4. Prior to commencement of the test the designated Safety Representative in charge will conduct an inspection of the application of the plan. Any deviations will be corrected before the test may commence.

1.4. Definition – Class Three Test

- A. Class Three Test: Any test that is confined to a specific location, in which no team members are performing work activities or team members can be readily reassigned and due to the minimal hazards associated with:
  1. the test pressure, median, voltage, and / or mechanical movement of parts;
  2. that in the event of mechanical failure of the equipment, release of test median or accidental contact;
  3. the potential to cause injury, or property or equipment damage is minimal.
- B. Class Three Test Requirements
  1. The Test Coordinator and Safety Personnel will conduct a Pre-Test meeting to:
    - a. Review the potential hazards associated with the test and agree the test meets the criteria for a Class Three Test;
    - b. Establish safe distances of boundaries to be maintained;
    - c. Identify the quantity of signs (Danger Test In Progress) required and additional means i.e., barricades, cones, etc. required to identify boundaries;
    - d. Identify who the individual will be that remains in the area of the test to alert anyone coming to close to or crossing established boundaries.
    - e. Identify individuals authorized to enter test area.
  2. Prior to commencement of the test a STA meeting will be conducted with individuals participating in the test activities to identify roles and responsibilities.
  3. Prior to commencement of the test the designated Safety Representative in charge will conduct an inspection of the application of the plan. Any deviations will be corrected before the test may commence.

## PIPING PRESSURE TESTING

This specification has been revised as indicated below and described in the revision record on the following page. Please destroy all previous revisions.

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Revision	Date	Originator's Name & Initials	Reviewed/Checked By	Pages
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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

No		Name & Initials		

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<u>APPROVALS</u>	<u>SIGNATURES</u>	<u>DATE</u>
Lead Engineer	_____	_____
Project Manager	_____	_____

**ISSUED FOR:**            Construction            Other \_\_\_\_\_

**REMARKS:**

**Record of Revisions**

Revision No.	Date	Description

## **PIPING PRESSURE TESTING**

### 1. GENERAL

#### 1.1. Summary

##### A. Scope of Specification

This specification prescribes the methods, tasks, scope, and criteria for testing installed piping systems. Any deviation from this specification requires written authorization from Hart Engineering.

B. Work Not Included

The following are excluded from the requirements of this specification:

1. Any package unit previously tested by the Manufacturer in accordance with the applicable codes.
2. Atmospheric sewers and drains.
3. Plumbing systems, which are tested in accordance with the applicable plumbing codes.
4. Lines and systems open to the atmosphere.
5. Liquid petroleum transportation piping systems under the jurisdiction of ASME B31.4.
6. Gas transmission and distribution piping systems under the jurisdiction of ASME B31.8.

C. Terminology

1. Calculated Test Pressure: The test pressure determined in accordance with Section 3.3, of this specification.
2. Minimum Test Pressure: The lowest allowable test pressure gauge reading. (The calculated test pressure plus the additional pressure resulting from the static head of the test fluid.)
3. Maximum Test Pressure: The highest allowable test pressure gauge reading. (The pressure test rating of the weakest component in the test system.)
4. Piping: An assembly of piping components being tested at one time using a single test procedure.
5. Test Temperature: Minimum temperature occurring during the test period of either the metal temperature of the piping being tested (incl. any vessels/equipment included in the test) or the test fluid temperature.
6. System Test: A test that includes multiple sections of piping, having the same or different design pressures, but which are tested together at one time using a single test procedure and pressure.

1.2. References

The industry publications listed below form part of this specification. Each publication shall be the latest revision and addendum in effect on the date this specification is issued for construction unless noted otherwise. Except as modified by the requirements specified herein or the details of the drawings, work included in this specification shall conform to the applicable provisions of these publications.

A. API (American Petroleum Institute)

1. API 600 Steel Gate Valves - Flanged and Butt-Welding Ends

2. API 602 Compact Steel Gate Values

B. ASME (American Society of Mechanical Engineers)

1. ASME B16.5 Piping Flanges and Flanged Fittings
2. ASME B16.21 Nonmetallic Flat Gaskets for Pipe Flanges
3. ASME B16.34 Valves – Flanged, Threaded, and Welded End
4. ASME B31.1 Power Piping
5. ASME B31.3 Process Piping

C. ASTM (American Society for Testing and Materials)

3. ASTM A36 Specification For Structural Steel

1.3. Pressure Testing

A. The calculated and maximum test pressure for each line shall be specified in the Pipe Line List. Additional data, as listed below, shall be provided by HART Engineering, or it's performing/installing sub-tier contractor:

1. Equipment test pressures
2. Test pressures of special piping components such as ball valves and butterfly valves
3. Special testing instructions and cautionary notes

2. PRODUCTS

2.1 Pressure Test Blinds/Blanking Flanges

A. Plain test blanks with 1/16-inch flat, non-asbestos, full face or ring type gaskets shall be used for blanking flat face, raised face, male and female, and tongue and groove type flanges. Provide full-face blanks and gaskets at 12S# CI connections. However, where permanent operational blinds are installed, they may be used for field pressure testing.

B. A field procedure must be established and care taken to ensure the installation and account for the removal of material(s) and components specified and used to conduct any testing. The following is an example of one method for identifying test material(s) and components:

1. Plate material, extra length bolts, and gaskets for testing shall be furnished by the field unless dictated otherwise by contract requirements.
2. The outer periphery (edge) of each test gasket shall be marked with a spot of fluorescent yellow paint in 4 spots (equally spaced at 90-degree/quadrant intervals) prior to installation.
3. End points of studs and heads of bolts shall be marked with a spot of fluorescent yellow paint.
4. Refer to Attachment 03 for maximum test pressures at various thicknesses for test blanks.

3. EXECUTION

3.1. Preparation



A. General

1. Prior to initial operation, all installed piping shall be pressure tested except where otherwise qualified in this specification.
2. The test shall be hydrostatic using water unless there is a possibility of damage due to freezing.
3. The following systems may be tested pneumatically.(with authorization from the Owner of the installation):
  - a. Piping with linings subject to damage by the hydrostatic test liquid.
  - b. The instrument air headers shall be tested with dry air. A commodity test as described in Section 3.4B., of this specification, may be used if the system is complete and the 'instrument air' system compressor is operational.

D. Vessels and Equipment

1. The following shall be excluded from hydrostatic tests:
  - a. Vessels or equipment supported by other vessels or equipment or by a support structure or foundation, not capable of supporting the hydrostatic test load.
  - b. Vessels or equipment not capable of sustaining the hydrostatic test load, and those with internals or linings that would be damaged by the test fluid.
2. The following shall be excluded from all pressure tests:
  - a. Pumps, compressors, and turbines.
  - b. Provided and/or furnished equipment, and other piping system components specifically indicated by the Original Equipment Manufacturer(s) (OEMs) as not to be subject to system and/or pressure testing.
3. The pressure on any point in vessels, equipment or other system components included in the pressure test shall not be greater than the shop test pressure for that equipment as stated on the related manufacturer's/vendor's drawing, supplier's equipment drawing, or other data sheets.
4. Vessels, equipment and other system components that must be specifically excluded from the overall test, due to test conditions and/or requirements shall be effectively isolated. These specifically excluded components may be effectively isolated/protected from test-related damages/impacts may by the following means;
  - a. the piping shall be disconnected,
  - b. the connections to the equipment shall be blanked/blinded, and
  - c. the excluded equipment shall be tested separately in accordance with the OEM's guidelines.
  - d. If the piping cannot be disconnected (welded connection), one of the following shall be implemented:

3.2. Test Methods And Pressures For ASME B31.3 Piping Systems

A. Hydrostatic Testing of Piping Designed for Internal Pressure

1. The hydrostatic test pressure at any point in the system shall be as follows:

- a. No less than 1-1/2 times the design pressure.
- b. For a design temperature above the test temperature, the minimum test pressure shall be as calculated by the following equation:

EQUATION 1:

$$P_t = \frac{1.5PS}{S} \quad \text{where} \quad \frac{S_t}{S} = 6.5 \text{ (maximum)}$$

Where;

$P_t$  = Minimum hydrostatic gauge pressure (psi)

$P$  = Internal design gauge pressure (psi)

$S_t$  = Allowable stress at test temperature (psi)

$S$  = Allowable stress at design temperature (psi)  
(Refer to Table 1, Appendix A, ASME B3 1.3)

- B. Where the test pressure as defined above would produce a stress in excess of the yield strength at test temperature, the test pressure shall be reduced to the pressure at which the stress shall not exceed the yield strength at the test temperature.

The maximum pressure ‘not to exceed yield strength’ may be calculated by the following equation:

EQUATION 2:

$$P_m = \frac{2YT}{D}$$

Where;

$P_m$  = Maximum Test Pressure (psig)

$Y$  = Minimum Specified Yield Strength (psi)

$T$  = Specified Pipe Wall Thickness Minus Mill Tolerance (in)

$D$  = Outside Diameter (in)

3.3. PIPING PRESSURE TESTING

- A. If the design conditions of piping attached to a vessel are the same as those of the vessel, the piping and vessel may be tested together at the test pressure of the vessel. However, if the piping may be subject to higher design conditions; if it requires a higher test than the connected equipment; or if the piping is designed for lesser operating conditions than the connected equipment and could be overstressed by a system test, it shall be isolated and tested separately.
- B. Where the test pressure of the piping exceeds the vessel test pressure and it is not

considered practical to isolate the piping from the vessel, the piping and the vessel may be tested together at the vessel test pressure, provided the Owner approves and the vessel test pressure is not less than 77 percent of the piping test pressure calculated in accordance with Equation 1.

#### 3.4. Hydrostatic Testing of Piping Designed for External Pressure

- A. Lines in external pressure service shall be subjected to an internal test pressure of 1-1/2 times the external differential design pressure but no less than a gauge pressure of 15 psi.
- B. In jacketed lines, the internal line shall be pressure tested on the basis of the internal or external design pressure, whichever is more critical. This test must be performed before completion of the jacket to provide visual access to the joints of the internal line.
- C. The jacket shall be pressure tested on the basis of the jacket design pressure. Care must be taken to prevent damage to the internal line when testing the jacket.

#### 3.5. Pneumatic Testing

If the piping is tested pneumatically, the minimum test pressure shall be 110 percent of the design pressure.

#### 3.6. Hydrostatic-Pneumatic Testing

A combination hydrostatic-pneumatic test is permissible. The pneumatic test pressure shall be in accordance with Section 3.3 F., of this specification. The pressure in the liquid filled portion of the piping shall not exceed that given in Section 3.3A., of this specification.

#### 3.7. Test Methods And Pressures For ASME B31.1 Piping Systems

##### A. Hydrostatic Testing of Boiler External Piping (ASME B31.1)

- 1. Boiler external piping shall be hydrostatically tested in accordance with PG-99, Section 1, of the ASME Boiler and Pressure Vessel Code. The test shall be conducted in the presence of the authorized inspector.

##### B. Hydrostatic Testing of Non-boiler External Piping

- 1. The hydrostatic test pressure at any point in the piping system shall be no less than 1-1/2 times the design pressure. The minimum test pressure shall be as calculated by the following equation:

Equation 3:

$$P_t = 1.5P$$

Where;

P<sub>t</sub> = Minimum hydrostatic gauge pressure (psi)

P = Internal design gauge pressure (psi)

2. At no time during the pressure test shall any part of the piping system be subjected to a stress greater than 90 percent of its yield strength (0.2 percent offset) at test temperature.
3. The maximum test pressure at which the stress produced in the piping shall not exceed 90 percent of the yield strength of the piping material at test temperature shall be calculated by the following equation:

Equation 4:

$$P_m = \frac{2(0.9Y)T}{D}$$

Where;

P<sub>m</sub> = Maximum test pressure (psig)

0.9Y = 90 percent of the minimum specified yield strength of the piping material (0.2 percent offset).

T = Specified pipe wall thickness minus mill tolerance (in.)

D = Outside diameter (in.)

C. Pneumatic Testing

1. The pneumatic test pressure shall be no less than 120 percent nor more than 150 percent times the design pressure of the piping system.

D. Initial Service Test

1. When authorized by the Owner, an initial service test and examination is acceptable when other types of tests are not practical or when leak tightness is demonstrable due to the nature of the service.
2. When performing an initial service test, the piping system shall be brought up to normal operating pressure and continuously held for 10 minutes, minimum. The piping system shall show no visual evidence of weeping or leaking.

3.8. Test Preparation - Field Procedure

- A. Joints, including welds, shall be left non-insulated and exposed for examination during the test, except that joints previously tested in accordance with this specification may be insulated or covered. If a sensitive leak test is required (according to Section 3.3H, of this specification), all joints mentioned above also shall be left unprimed and unpainted.
- B. Underground portions of piping systems may be tested and covered before testing aboveground portions.
- C. Piping designed for vapor or gas shall be provided with additional temporary supports, if necessary to support the weight of the test liquid. Where required, temporary supports shall be specified in the pressure test documents.

- D. Lines that are counterweight supported shall be temporarily blocked during testing in order to sustain the weight of the test fluid. Spring hangers that have been provided with stops for carrying the test load normally do not require additional temporary supports; if this is not the case, temporary support must be provided before filling the system.
  - E. Before testing, the following procedures shall be carried out:
    - 1. Verify that any required heat treatment has been performed.
    - 2. Piping systems shall have been completely checked (punched out).
    - 3. Lines, vessels, and equipment shall be checked to ensure that the entire system can be completely drained after testing.
    - 4. Vents or other high point connections shall be opened to eliminate air from lines that are to receive a hydrostatic test.
    - 5. System shall be purged of air before hydrostatic test pressure is applied.
  - F. Field personnel shall review all vessels and internals in order to determine best method to prevent air entrapment when filling and to prevent vacuum when draining.
  - G. Short pieces of piping that must be removed to permit installation of a blind or blank shall be tested separately.
  - H. Flanged joints at which a blank is inserted to isolate other equipment during a test need not be tested after blank is removed.
  - I. Lines containing check valves shall have the source of pressure located in the piping upstream of the check valve so that the pressure is applied under the seat. If this is not possible, remove or jack up the check valve closure mechanism or remove check valve completely, and provide necessary filler piece or blinds.
  - J. When conducting tests at freezing temperatures, the test shall not take more than 4 hours, and special precautions such as warming the line test water shall be observed to avoid freezing damage. Follow precautions to minimize the risk of brittle fracture as noted in Section 3.6G., of this specification.
  - K. Systems that include expansion joints shall be investigated to refer to that any required temporary restraints, anchors, or guides are installed or removed prior to test.
  - L. When a pressure test is required to be maintained for a period of time during which the testing medium in the system would be subject to thermal expansion, provision shall be made for relief of any pressure greater than the maximum test pressure.
  - M. Piping, or sections of piping, to be tested may be isolated by closed valves provided the valve closure is suitable for the test pressure.
- 3.9. Hydrostatic Test Procedure – To Hold for 1 hour at Ambient Temperature
- A. In order to hydrostatic test as much piping as possible at one time, a systems test may be employed. This test shall include one or more lines and, if possible, connected to vessels and equipment.
  - B. The minimum test pressure for a system test shall be such that each line in the system is subjected to a test pressure in accordance with Section 3.3, of this specification.

- C. The maximum system test pressure shall not exceed the pressure test rating of any piping component, or the shop test pressure of any vessels or equipment included in the test system. Maximum test pressures for flanges and valves conforming to ASME B1.6.5 and ASME B16.34 are given in Attachment 01.
- D. Systems or sections of systems to be tested may be isolated by closed valves, provided the valve body and seat are suitable for the test pressure.
- E. Where a suitable valve is not available, vessels, equipment, or other piping not included in the system pressure test shall be either disconnected from the system or isolated by blinds or other means during the test.
- F. The normal locations for the pressure test gauge is at grade near the pressure test pump. Readings may be made at higher points providing the gauge pressure reading and the static head (0.433 psi/ft) between grade and the point of measurement do not exceed the maximum test pressure. Gauges shall be tagged with the date last calibrated, and this activity shall be recorded.
- G. Hydrostatic test pressure shall not be applied until the vessel or equipment and its contents are at approximately the same temperature. To minimize the risk of brittle fracture, pressure tests through vessels and equipment shall not be conducted when the test liquid or metal temperature is below 60 degrees F (15.6 degrees C). Pressure tests in ferritic piping systems that do not include vessels or equipment may be conducted below 60 degrees F but shall not be conducted when the test liquid or metal temperature is below 40 degrees F (4.5 degrees C).
- H. Hydrostatic test pressure shall be maintained for a sufficient length of time to visually determine whether there are any leaks, but no less than 10 minutes. Contractor is not required to maintain test pressure in excess of 2 hours after notification of the Client's authorized inspector.

### **Minimum Metal Temperature**

#### 3.10. Pneumatic Test Procedure

- A. If an inert gas is used, air monitoring is required for oxygen content.
- B. All testing equipment shall be calibrated within the last 3 months.
- C. When pneumatic testing at over 15 psig, a preliminary check at 15 psig shall be made to locate major leaks. The pressure shall be increased in gradual steps of 5 psig or 10 percent of the test pressure, whichever is greater.
- D. When the system has been brought up to the test pressure shown on the piping Pressure test system record,
  - 1. the pressure shall then be reduced to the design pressure before examine or leakage.
  - 2. Joints and welds shall be covered with soap solution in order to detect any leakage.
  - 3. Soap shall be a commercial preparation made specifically for leak detection.
- E. Before soaping the joints;

1. the entire line should be walked to determine whether there is any audible evidence of leakage.
  2. Any leaks found at the time shall be marked and repaired after first depressurizing the line.
- F. Bolting shall not be tightened while systems being tested are subject to pressure(s) at or above 30psig.
- 3.11. Test Records
- E. Test medium/media
  - F. Test pressure
  - G. Minimum ambient temperature
  - H. Test medium temperature
  - I. Certification by examiner
  - J. Test results
  - K. Name of test operator
  - L. Minimum metal temperature (if applicable)
- 3.12. Test Completion
- E. If leaks are found, their location shall be marked, the pressure shall be gradually released, and the piping shall be drained or vented. Appropriate repair or replacement shall be made. The affected piping shall be re-tested at the pressures originally specified for the test
- F. After completion of testing,
1. all temporary blanks and blinds shall be removed,
  2. all operating blinds returned to proper position, and
  3. all lines and piping components (except those tested according to Section 3.4B., of this specification) shall be completely drained.
  4. Valves, orifice plates, expansion joints, and short pieces of piping that have been removed shall be reinstalled with proper new gaskets in place.
  5. Valves that were closed during hydrostatic test shall be opened to ensure drainage of the bonnet cavity.
  6. Lines being drained after testing shall have all vents open.
  7. Piping systems downstream of check valves shall be inspected to ensure complete drainage.
- G. General
1. Instruments which were removed or blocked out for test shall be reinstalled and blocks placed in the normal operating position.

2. Bolting and gaskets used for pressure testing shall be removed and replaced with bolts and gaskets specified in the Line Class.
3. Check valves that were jacked open or the internals were removed for pressure testing shall be returned to their proper operating position.
4. Vessel and equipment internal closures which were opened specifically for pressure testing shall be closed.
5. Instruments and process lead lines that were subjected to the hydrostatic pressure test shall be blown out with dry air or nitrogen.
6. Vent and drain connections that were added solely for pressure testing shall be closed and seal welded as required. Drains shall have either the valve closed and plugged or, if the valve is removed, the connection plugged and seal welded as required.
7. Painting and insulation shall be completed after inspection of seal welded vents and drains.
8. Strainer screens shall be removed, cleaned, and reinstalled.

### Maximum Hydrostatic Test Pressure (psig) For Flanges And Valves

Flange Rating (Class)	Material											
	Carbon Steel		Carbon Moly		CR-Moly		Stainless Steel					
	Normal (1.1)		C ½ (1.5)		½ -1/2 1 1-1/4-1/2(1.9) 2-1/4-1(1.10) 5-1/2(1.13) 9-1(1.14)		304(2.1) 316(2.2) 321(2.4) 347.348(2..5)		304L, 316L(2.3)		309(2.6) 310(2.7)	
	Shell	Seat	Shell	Seat	Shell	Seat	Shell	Seat	Shell	Seat	Shell	Seat
150	450	285	400	265	450	290	425	275	350	230	400	260
300	1125	740	1050	695	1125	750	1100	720	900	600	1025	670
400	1500	990	1400	925	1500	1000	1450	960	1200	800	1350	895
600	2225	1480	2100	1390	2250	1500	2175	1440	1800	1200	2025	1345
900	3350	2220	3150	2085	3375	2250	3250	2160	2700	1800	3025	2015
1500	5575	3705	5225	3470	5625	3750	5400	3600	4500	3000	5050	3360
2500	9275	6170	8700	5785	9375	6250	9000	6000	7500	5000	8400	5600



1. The above chart is based on ASME B 16.5, and provides the maximum allowable hydrostatic test pressures of 1/2-inch through 24-inch flanges (shell test) and flanged and standard class weld end valves (shell test, with valve open and seat test, with valve closed). Seat test is based on ASME B 16.34, Paragraph 2.5.3.
2. Flanged valves manufactured according to API-600 and API-602 may be tested in accordance with the above chart. Carbon steel, Normal (1.1), 800# scrd. or S.W. valves manufactured according to API-602 and API-606 may be tested to 3000 psig (shell test) or 1975 psig (seat test).
3. For valves not conforming to the above standards or ASME B 16.5, the Manufacturers' recommended test pressure limits for both shell and seat shall be used.
4. Maximum test pressures for flanges and valves over 24 inches and piping components not covered by this chart shall be provided by Fluor Daniel Piping Engineering as applicable.
5. The maximum test pressure for pneumatic testing shall not exceed 75 percent of the stated values.

**Schedule Of Maximum Allowable Hydrostatic Test Pressure (psig) For The Listed Test Blind Thicknesses**

Plate Thickness	Nominal Pipe Size													
	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"
1/4"	2,013	931	563	260	153	99	70	58	45	35	29	20	13	9
3/8"	4,528	2,094	1,267	585	345	222	158	131	100	79	64	45	29	20
1/2"	8,050	3,722	2,252	1,041	614	395	281	233	178	141	114	79	51	35
5/8"	12,579	5,816	3,519	1,626	959	617	438	364	278	220	178	124	79	55
3/4"		8,376	5,067	2,341	1,381	888	631	523	401	317	257	178	114	79
7/8"			6,896	3,187	1,879	1,208	859	713	546	431	349	242	155	108
1"			9,007	4,162	2,455	1,578	1,122	931	713	563	456	317	203	141
1-1/8"				5,268	3,107	1,998	1,420	1,178	902	713	577	401	257	178
1-1/4"				6,503	3,836	2,466	1,753	1,454	1,113	880	713	495	317	220
1-3/8"				7,869	4,641	2,984	2,121	1,759	1,347	1,064	862	599	383	266
1-1/2"				9,365	5,523	3,551	2,525	2,094	1,603	1,267	1,026	713	456	317
1-5/8"					6,482	4,168	2,963	2,457	1,881	1,487	1,204	836	535	372
1-3/4"					7,518	4,834	3,436	2,850	2,182	1,724	1,397	970	612	431
1-7/8"					8,630	5,549	3,945	3,272	2,505	1,979	1,603	1,113	713	495
2"					9,819	6,313	4,488	3,722	2,850	2,252	1,824	1,267	811	563

**NOTE:**

1. The tabulated pressures above are based on the formula stated in ASME B3 1.1 or ASME B3 1.3 using the following:

- a. Flat non-asbestos gaskets conforming to ASME B 16.21.
  - b. Structural grade carbon steel plate, ASTM A36 having a minimum specified yield strength of 36,000 psi.
2. For plate that is identified as having a lower minimum yield strength, the allowable hydrostatic pressure must be reduced in accordance with the following formula:

EQUATION 5:

$$P_{ma} = \frac{Y_x}{Y}$$

Where:

Pma	Maximum allowable test pressure
Y	Minimum specified yield strength, ASTM A36
Yx	Minimum specified yield strength for material selected

3. Pneumatic test pressures shall not exceed 50 percent of the values indicated.

- End Of Section -

# **SECTION 19**

# **OCCUPATIONAL HEALTH**



**HAZARD  
COMMUNICATION  
PROGRAM**

## **HAZARD COMMUNICATION PROGRAM** **(HAZCOM or ‘The Right To Know Law’)**

### **Purpose**

The purpose of the Hazard Communication Program is to inform HART employees, and other/subcontractor employees of known chemical hazards that may exist in the work place. Different chemical substances are handled daily by HART employees. The routine handling of chemicals, for many of these employees, may be an important and integral part of their normal work requirements. Knowledge of the hazards associated with those chemicals, safe handling procedures, required personal protective equipment, manufacturers’ recommendations and any related emergency procedures are extremely important for these employees, as well as those that may work near them.

### **Scope**

Chemical substances vary greatly in the degree and type of hazard they may pose under certain defined conditions. Some materials present a severe fire or explosion potential but have little ability to produce adverse health effects. Other materials may pose a small fire hazard, but may be highly toxic if inhaled, ingested or come in contact with the skin. Other materials, such as certain compressed gases, may pose little health or fire hazard, but due to the physical characteristics, pressurized storage can be dangerous if mishandled. It is very important that all HART employees and our subcontractor employees understand the variety of hazards associated with materials with which they may contact.

The communication of this information to employees, in order to protect their health and well being, is a high priority at HART. Over the years, HART has continued to develop programs that help to provide necessary information to our employees and subcontractors. This written program has been prepared in compliance with the Hazard Communication Standard (29 CFR 1910.1200) to insure that employees who must work with hazardous substances are informed of these hazards as well as of appropriate Personal Protective Equipment and safe methods of handling. The Hazard Communication Program letter to all employees shall be posted in a conspicuous place, i.e. project bulletin board. This provides a quick reference for employees as to where the program is located and the individual responsible for administrating the program.

The HART Hazard Communication Coordinator will be responsible for the coordination of the Hazard Communication Program for all contractors and subcontractors working at any HART location. All contractors, regardless of work scope, shall provide HART with a copy of their Hazard Communication Program. The included information, complete with all applicable Material Safety Data Sheets/Safety Data Sheets shall be submitted prior to mobilizing on site, as a preparatory step prior to any work.

Each contractor shall provide the HART Hazard Communication Coordinator with a copy of the Material Safety Sheet for any new chemical that is to be introduced at a work location, prior to bringing the material on site. All employees that could be potentially affected by the new material shall receive training on all physical and health hazards, visual appearance, odors and other associated characteristics, required protective measures, monitoring devices, personal protective equipment and emergency procedures.

The HART Hazard Communication Coordinator will be responsible for maintaining an

inventory list of, and Material Safety Data Sheets/Safety Data Sheets, for all such materials brought to the work site.

The Hazard Communication Program and Material Safety Data Sheets/Safety Data Sheets will be made available, upon request to employees, their designated representatives and the Assistant Secretary and the Director in accordance with the requirements of 29 CFR 1910.1020(e).

The Hazard Communication Program's Training and/or written material contained within this procedure will either be translated in written form, or verbally for non-English speaking employees, in their native tongue, by their respective employers.

### **Program Summary**

The major elements of this program are as follows:

- Labels and other forms of warning
- Material Safety Data Sheets/Safety Data Sheets (SDS/MSDS):
  - - HART and Subcontractor(s)
  - - Client
- Employee training
  - - HART Engineering Corporation
  - - Sub-tier Subcontractors
- Hazardous chemical inventory list
- Methods of informing employees of hazards of non-routine tasks
- Methods for informing subcontractor employees

### **Labels and Other forms of Warning**

The OSHA Standards require that every container in the work place, which contains a hazardous substance or mixture, be identified as to such contents and hazards.

- Hazard Definitions
  - Physical Hazards
  - Flammable
  - Combustible
  - Oxidizer
  - Pyrophoric, (explosive or unstable)
  - Water reactive
  - Compressed gas
- Health Hazards
  - Carcinogenic, mutagenic or teratogenic
  - Causes target organ effects  
(dermatitis, eye damage, reproductive effects, neurotoxins, systemic toxicants)
  - Toxic or highly toxic
  - Corrosive
  - Irritant
  - Sensitizer

### **Labeling**

Every container containing a hazardous chemical will be marked or labeled so that a rapid determination of content identity as well as hazards can be made. This includes drums, pails, buckets, any portable tanks and all containers sized for individual use.

- Labeling Responsibilities
  - It is the receiving Supervisor's responsibility to insure all containers coming on site are labeled properly with:
    - Product Identity
    - Appropriate hazard-warning statement(s)
    - Manufacturer or responsible party
    - Required Personal Protective Equipment
- It is the responsibility of every HART Project site employee to ensure that container labels or other means of container identification remain affixed to the container and to notify their Supervisor immediately if the information has been removed or otherwise not available.
- It is the responsibility of the employee transferring a material from one container (i.e., portable tank) into another container (drums, buckets, pails, bags, bottles, cans, etc.) to label the content of the container and affix the appropriate Hazardous Material Identification (HMI) guide label.
- The HMI Label does not list specific hazards, but serves as an immediate identification of hazards and appropriate protective equipment. The HMI Label utilizes a color code, hazard numerical rating system and alphabetical protective equipment code index.

## **HAZARD CLASSIFICATION KEYS - COLOR AND NUMERICAL RATING INDEX**

### **HEALTH:**

#### **COLOR BLUE**

- |           |                  |   |
|-----------|------------------|---|
| <b>4.</b> | <b>EXTREME:</b>  | Highly Toxic--May be fatal on short-term exposure. Special protective equipment required. |
| <b>3.</b> | <b>SERIOUS:</b>  | Toxic--Avoid inhalation or skin contact   |
| <b>2.</b> | <b>MODERATE:</b> | Moderately Toxic--may be harmful if inhaled or absorbed                                   |
| <b>1.</b> | <b>SLIGHT:</b>   | Slightly Toxic--May cause slight irritation   |
| <b>0.</b> | <b>MINIMAL:</b>  | All chemicals have some degree of toxicity  |

### **FLAMMABILITY:**

#### **COLOR RED**



- 4. **EXTREME:** Extremely flammable gas or liquid--Flash Point below 73 Degrees <sup>F</sup>
- 3. **SERIOUS:** Flammable--Flash Point 73 Degrees <sup>F</sup> to 100 Degrees <sup>F</sup>
- 2. **MODERATE:** Combustible--Requires moderate heating to ignite
- 1. **SLIGHT:** Slightly Combustible--requires strong heating to ignite
- 0. **MINIMAL:** Will not burn under normal conditions

**REACTIVITY:**

**COLOR YELLOW**

- 4. **EXTREME:** Explosive at room temperature
- 3. **SERIOUS:** May explode if shocked, heated under confinement or mixed with water
- 2. **MODERATE:** Unstable, may react with water
- 1. **SLIGHT:** May react if heated or mixed with water
- 0. **MINIMAL:** Normally stable, does not react with water

**PERSONAL PROTECTIVE EQUIPMENT GUIDE (KEY):**

- A. Safety Glasses
- B. Safety Glasses, Gloves
- C. Safety Glasses, Gloves, Synthetic Apron
- D. Face Shield, Gloves, Synthetic Apron
- E. Safety Glasses, Gloves, Dust Respirator
- F. Safety Glasses, Gloves, Synthetic Apron, Dust Respirator
- G. Safety Glasses, Gloves, Dust and Vapor Respirator
- H. Safety Glasses, Gloves, Synthetic Apron, Dust and Vapor Respirator
- I. Safety Glasses, Gloves, Vapor Respirator
- J. Splash Goggles, Gloves, Synthetic Apron, Vapor Respirator
- K. Air Line Head or Mask, Gloves, Full Suit, Boots

**Ask your Supervisor for special handling instructions**

**SAFETY DATA SHEETS/MATERIAL SAFETY DATA SHEETS (SDS/MSDS)**

It will be the Project Site Supervisor's and/or Project Manager's responsibility to establish and maintain a complete Hazardous Chemical Inventory List and corresponding Material Safety Data

Sheets/Safety Data Sheets for all hazardous chemicals brought on site by HART and associated subcontractors.

Project Supervision will be responsible for determining the location and availability of the client's Material Safety Data Sheet file(s) and conveying this information to all HART and associated subcontractor employees.

A complete Material Safety Data Sheet file and instructions on how to access the client's Material Safety Data Sheet file will be maintained in the Project Field Office.

The Purchasing and Receiving Departments will maintain a copy of the Hazardous Material Inventory List to insure that no chemical is purchased or received without a SDS/MSDS on file or the request for an SDS/MSDS being made at the time of order and the receipt of such prior to or at the time of delivery.

If an employee discovers that an SDS/MSDS is not available for a particular chemical, that worker is to bring this immediately to the attention of his/her foreman. The foreman and or employee should inform the project's supervisor or manager. The Project Supervisor or Manager will determine if a SDS/MSDS is required. If required, the project office shall contact the manufacturer requesting a copy of the SDS/MSDS be faxed and a clean hardcopy express mailed to the project. Project supervision must also ensure that a copy of any new SDS/MSDS's is sent to the HART Corporate Office for inclusion in the master HAZCOM file.

## **TRAINING AND INFORMATION**

All employees, during the new hire orientation, will be given instructions as outlined in Attachment B, Orientation to Hazard Communication, on the following:

- Requirements of the OSHA Hazard Communication
- Standards HART Hazard Communication Program
- Labeling System and requirements
- Location and availability of SDS/MSDS files
- Protective equipment
- Non-routine task

Employees will be given detailed training on Material Safety Data Sheet interpretation.

- Location
- Sections of the SDS/MSDS
- Definitions

The training will be documented by having the employee complete a Hazard Communication Training Record Form. Employees will receive additional instructions on non-routine tasks, hazards and protective measures at the work site. Employees will receive on-going training by means of foremen's meetings, gangbox meetings, 'Toolbox Talks' and special classes for new hazardous chemicals and/or processes as they are introduced to the project. Annual review of the HAZCOM program is required of all employees.

### **Definitions:**

The term "employee" is considered to be any employee of HART, a related contractor, subcontractor or client that could be potentially affected by the chemical or process. Attached is a Glossary of Material Safety Data Sheet (SDS/MSDS) Terms and Definitions. The glossary is to

be maintained at the project SDS/MSDS file.

**Attachments:**

<b>Attachment A</b>	<b>Hazard Communication Letter to all Employees</b>
<b>Attachment B</b>	<b>Orientation to Hazard Communication</b>
<b>Attachment C</b>	<b>Hazard Communication Training Record</b>
<b>Attachment D</b>	<b>Sample Form List for Hazardous Chemicals</b>
<b>Attachment E</b>	<b>Hazard Communication Compliance Checklist</b>
<b>Attachment F</b>	<b>Glossary of SDS/MSDS Terms and Definitions</b>

**HAZARD COMMUNICATION PROGRAM LETTER**

**ATTACHMENT A**

TO ALL EMPLOYEES

To: All Employees  
From: Hazard Communication Program

**NOTICE IS HEREBY GIVEN TO ALL EMPLOYEES:**

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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

1. Hart is required by 29 CFR **1926.59** to have a Hazard Communication Program. A copy of this program is available to be reviewed by employees at this location, and the person to explain the program is also identified in Item #3.

Hart Project On-Site Office,  
CYTIVA CLEAN ROOM EXPANSION – PHASE 1  
14 WALKUP DRIVE  
WESTBOROUGH, MA

2. A list of hazardous chemicals known to be present in the work area is available for review by employees during each work shift at this location in the project.

Hart Project On-Site Office

3. The person responsible for the Hazard Communication Program on this project is:

Mr. Ray Lagesse, Project Supervisor

This person will answer any questions concerning the project Hazard Communication Program.

4. The Corporate Safety Department will also answer any questions concerning the Hart Hazard Communication Program.

**THIS NOTICE WILL REMAIN POSTED AND  
VISIBLE TO EMPLOYEES UNTIL FURTHER NOTICE.**

## **ORIENTATION TO HAZARD COMMUNICATION**

**ATTACHMENT B**  
**Page 1 of 2**

### **GENERAL**

Hart has long been a leader in employee safety and health. In keeping with that tradition and to comply with the “Employee’s Right to Know” laws, Hart has instituted a Hazard Communication Program.

Approximately 25 million workers, about one in four in the nation’s work force, use one or more chemicals in the work place. There are an estimated 570,000 existing chemical products and

hundreds of new ones being introduced annually.

Chemicals can produce both good and bad effects. When chemicals are used properly, they can improve our lives at home and at work. If chemicals are used improperly, potential problems may arise.

To ensure the proper use of chemicals or other potentially harmful materials, the Occupational Safety and Health Administration (OSHA) has developed a Hazard Communication Standard. This new standard became effective throughout the United States on May 23, 1988 and revised in 2012.

## **PURPOSE**

The purpose of the Hazard Communication Standards is to reduce the potential for illnesses and injuries by training and educating workers to safely work with chemicals and materials that could be potentially hazardous if misused or abused.

The OSHA standard basically requires a written program to list materials, obtain Material Safety Data Sheets/Safety Data Sheets (SDS/MSDS), label containers, annually train employees, and make this information available to employees, their representatives, and health professionals.

## **MATERIAL/SAFETY DATA SHEET**

Material Safety Data Sheet (SDS/MSDS) is a fact sheet containing important health and safety information about chemicals in your work place. An SDS/MSDS for each chemical in your work place is available for your reference.

Employers will maintain copies of any SDS/MSDSs that are received with incoming shipments of the sealed containers of hazardous chemicals, will obtain an SDS/MSDS for sealed containers of hazardous chemicals received without an SDS/MSDS, and will ensure that the SDS/MSDSs are readily accessible during each work shift to employees.

Employers will ensure that employees are aware of any operations in their work area where hazardous chemicals are present and the location and availability of the written Hazard Communication Program including the list of hazardous chemicals and SDS/MSDSs.

## **ORIENTATION TO HAZARD COMMUNICATION**

**ATTACHMENT B**  
**Page 2 of 2**

### **MATERIAL SAFETY DATA SHEET SECTIONS**

1. **IDENTIFICATION:** This section identifies the chemical on the SDS as well as the recommended uses. It also provides the essential contact information of the supplier.
2. **HAZARD(S) IDENTIFICATION:** This section includes the hazards of the chemical and the appropriate warning information associated with this hazard.
3. **COMPOSITION/INGREDIENT INFORMATION:** This section identifies the ingredient(s) contained in the product indicated on the SDS, including impurities and

stabilizing additives. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed.

4. **FIRST AID:** This section describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical.
5. **FIRE FIGHTING:** This section lists the recommendations for fighting a fire caused by the chemical, including suitable extinguishing techniques, equipment and chemical hazards from fire.
6. **ACCIDENTAL RELEASE MEASURES:** This section provides recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, properties, or the environment. It may also include recommendations distinguishing between responses for large and small spills where the spill volume has a significant impact on the hazard.
7. **HANDLING AND STORAGE:** This section provides guidance on the safe handling practices and conditions for safe storage of chemicals, including incompatibilities.
8. **EXPOSURE CONTROLS/PERSONAL PROTECTION:** This section indicates the exposure limits, engineering controls, and personal protective equipment (PPE) measures that can be used to minimize worker exposure.
9. **PHYSICAL AND CHEMICAL PROPERTIES:** This section identifies physical and chemical properties associated with the substance or mixture.
10. **STABILITY AND REACTIVITY:** This section describes the reactivity hazards of the chemical and the chemical stability information. This section is broken into 3 parts: reactivity, chemical stability, and other.
11. **TOXICOLOGICAL INFORMATION:** This section identifies toxicological and health effects information or indicates that such data are not available. This includes routes of exposure, related symptoms, acute and chronic effects, and numerical measures of toxicity.
12. **ECOLOGICAL INFORMATION:** provides information to evaluate the environmental impact of the chemical(s) if it were released to the environment.
13. **DISPOSAL CONSIDERATIONS:** This section provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices. To minimize exposure, this section should also refer the reader to Section 8 (Exposure Controls/Personal Protection) of the SDS.
14. **TRANSPORT INFORMATION:** This section includes guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea.



15. **REGULATORY INFORMATION:** This section identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS.
16. **OTHER INFORMATION:** This section indicates when the SDS was prepared or when the last known revision was made. The SDS may also state where the changes have been made to the previous version. You may wish to contact the supplier for an explanation of the changes. Other useful information also may be included here.

**The written Site-Specific Hazard Communication Program will be maintained along with the SDS/MSDSs by the HART Project's On-Site Designated Safety Competent Person.**

**HAZARD COMMUNICATION TRAINING RECORD**

**ATTACHMENT C**

I, \_\_\_\_\_ have attended a safety training session informing me of this  
(print name)

project's Hazard Communication Program.

**Topics Addressed:**

- OSHA 1910.1200 Hazard Communication Standard
- OSHA 1926.59 Hazard Communication Standard
- Material Safety Data Sheets/Safety Data Sheets (SDSs/MSDSs)

- SDS/MSDS Definitions
- Reading and Interpretation of Labels
- Project List of Hazardous Chemicals
- Employee's Right as Defined by Both State and Federal Law
- Employee's Responsibilities Regarding the Established HAZCOM Program

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Last Four of SSN

**SAMPLE FORM FOR LIST FOR HAZARDOUS CHEMICALS**

**ATTACHMENT D**

Hazard Communication Coordinator: \_\_\_\_\_

Telephone: \_\_\_\_\_

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

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

**(SAMPLE FORM)  
LIST OF HAZARDOUS CHEMICALS KNOWN TO BE PRESENT**

**Note: A Material Safety Data Sheet (SDS/MSDS) is on file for each substance on this list. Details of specific physical and health hazards as well as protective measure can be found on the SDS/MSDS for individual chemicals.**

<b>Substance</b>	<b>Supplier/Source</b>	<b>Location</b>	<b>Use</b>	<b>SDS/MSDS No.</b>
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## HAZARD COMMUNICATION COMPLIANCE CHECKLIST

**ATTACHMENT E**  
**Page 1 of 1**

Has a list of hazardous material been compiled for the project? If so, does it include:

- Chemical and trade names?
- Storage location of material?
- Location where chemical is generally stored?

Does the project have or have access to all four volumes of Material Safety Data Sheets/Safety Data Sheets (SDS/MSDSs)?

Has a file or binder been established for other SDS/MSDSs?

Do bulk storage containers have standard NFPA labels or manufacturer labels that meet specific requirements?

Has an employee training program been developed for the project?

Has it been conducted for current, active employees?

- Is it part of the new-hire safety orientation?
- Do employees know how and where to obtain information on the hazardous chemicals they encounter in the work place?
- Do the employees know how and where to obtain information on the hazardous chemicals they encounter in the work place?
- Do the employees know where to find a copy of the project's written Hazard Communication Program?
- Have project employees been instructed in the reading and interpretation of manufacturer labels and SDS/MSDSs?
- Do employees know and understand the requirements of the OSHA and local hazard communication standards?
- Have employees been instructed as to the health and physical hazards of work area chemicals?
- Are employees aware of established emergency procedures?
- Has all employee training been properly documented and filed for reference?
- Do employees know what is required of the company?
- Do employees understand their "Right to Know" privileges?

## **TERMS AND CONDITIONS**

**ATTACHMENT F**  
**Page 1 of 5**

### **ACTION LEVEL:**

Concentrations used by OSHA and NIOSH to express a health or physical hazard. They indicate the level of a harmful or toxic substance/activity which requires medical surveillance, increased industrial hygiene monitoring, or biological monitoring. A substance's action level is the exposure level at which OSHA regulations take effect.

Action levels are generally set at one half of the permissible exposure limit (PEL), but the actual level may vary from standard to standard. The intent is to identify a level at which the vast majority of randomly sampled exposures will be below the PEL.

### **ACUTE HEALTH EFFECTS:**

Changes in your health that occurs in a short time period. Immediate changes in your health (such as dizziness, stinging or watery eyes, or breathing difficulty) that are caused by breathing, swallowing, or touching a harmful chemical.

### **BOILING POINT:**

The temperature at which a liquid boils or becomes a gas.

### **CAS NUMBER:**

Chemical Abstract Service Number. The Chemical Abstract Service assigns a unique identifying number to every chemical or mixture. This number helps identify chemicals that are very similar or share the same name.



**CARCINOGEN:**

Any substance that causes cancer or makes the body more vulnerable to cancer.

**CHEMICAL FAMILY:**

The larger group of related substances to which a particular chemical belongs. For example, isopropyl alcohol is part of the larger alcohol family. The chemical family can tell you about other substances similar to the one on your Material Safety Data Sheet (SDS/MSDS).

**CHEMICAL NAME OR IDENTITY:**

The name that a product is sold by. This section of an SDS/MSDS also includes a formal chemical or technical name and any other commercial names for this chemical.

**CHRONIC HEALTH EFFECTS:**

Changes in your health that take place over a period of weeks, months, or years caused by contact with a harmful chemical. Examples of chronic effects include kidney or liver damage, lung damage, or even cancer.

**CONDITIONS TO AVOID:**

Any conditions that might cause a chemical's substance to change, such as high temperature, water, or sunlight.

**ATTACHMENT F**

**Page 2 of 5**

**DERMATITIS:**

Skin inflammation characterized by itching and redness of the skin.

**DYSPNEA:**

Difficult breathing, feeling short of breath.

**EMPHYSEMA:**

Disease characterized by difficulty in breathing or coughing that occurs during exertion.

**EVAPORATION RATE:**

Tells how quickly a substance becomes a gas by comparing it to either ether, which evaporates quickly, or butyl acetate, which evaporates slowly. A chemical with a high evaporation rate turns into a vapor or gas easily and poses a greater risk of inhalation and should be used in a well-ventilated room.

**EXPLOSIVE LIMITS:**

The range of gas or vapor concentration (strength or amount) that will burn or explode near a spark, heat, or flame.

**EXTINGUISHING MATERIALS:**

Materials recommended for use in putting out fires, such as water, foam, alcohol foam, carbon dioxide (CO<sub>2</sub>), dry chemical, or sand.

**FLASH POINT:**

The temperatures at which a liquid or volatile solid gives off a vapor sufficient to form an

ignitable mixture with the air near the surface of the liquid.

**HAZARDOUS CHEMICAL:**

Any chemical that is a physical hazard or a health hazard.

**HAZARDOUS DECOMPOSITION:**

A list of hazardous materials that may be produced if a substance is exposed to heat, flame, oxidation, or other chemicals.

**HEALTH HAZARDS:**

Any chemical for which at least one valid scientific study demonstrates that the chemical could cause acute or chronic health problems to exposed employees.

**INCOMPATIBILITY:**

A list of substances that cause a chemical to react or change when they are mixed or are in contact.

**LD 50:**

Lethal dose **50** percent. The amount of substance that will kill **50** percent of the lab test animals receiving it. This dose is usually measured in milligrams per kilogram of body weight.

**ATTACHMENT F**  
**Page 3 of 5**

**SDS/MSDS:**

Material Safety Data Sheet/Safety Data Sheet. A fact sheet containing important health and safety information about chemicals in your workplace. An SDS/MSDS for each chemical in your workplace is available for reference.

**MUTAGEN:**

An agent that causes change in genes. Genetic changes may be inherited by offspring.

**National Institute for Occupational Safety and Health.** A research group that recommends substances to OSHA for regulation in the workplace.

**OSHA:**

Occupational Safety and Health Administration. An agency of the U. S. Department of Labor responsible for enforcing regulations that protect a worker's health and safety.

**PPM:** Abbreviation for parts per million, used to indicate extremely minute concentration of particulates in liquids and gases.

**PERCENTAGE VOLATILE BY VOLUME:**

The amount of a liquid or solid that can evaporate (become a gas). Substances with a high percentage evaporate quickly and can generate a higher concentration in an enclosed area.

**PEL:** Permissible Exposure Limit. The amount of a substance with which you can safely work for a given period of time. The Occupational Safety and Health Administration legally enforce PELs.

**PHYSICAL HAZARDS:**

Any chemical that is a physical hazard, a combustible liquid, a compressed gas, an explosive, a flammable solid, a liquid or gas, an organic peroxide, is pyrophoric, is reactivity unstable, or is water reactive.

**POLYMERIZATION:**

A chemical reaction in which molecules of a substance form a long chain and give off energy. If this process happens quickly, an explosion may occur.

**PULMONARY EDEMA:**

Fluid build-up and swelling in the lungs caused by lung tissue damage.

**REACTIVITY:**

A description of the conditions (such as strong sunlight, heat, or flame) that cause a chemical to change or react.

**RIGHT-TO-KNOW:**

The federal Hazard Communication Standard and similar state laws that provide workers with information on chemicals in the workplace.

**ATTACHMENT F**  
**Page 4 of 5**

**SENSITIZATION:**

Repeated contact with a substance causing reactions that become increasingly severe, such as an allergic reaction.

**STEL:**

Short-Term Exposure Limit. The highest concentration of a substance to which you can safely be exposed for a 15-minute period.

**SPECIFIC GRAVITY:**

The comparison by weight of an amount of a substance to an equal amount of water at a temperature of 39.2 degrees Fahrenheit.

**TERATOGEN:**

Any substance that causes damage to an embryo or fetus (in humans, an unborn child) without a substantial effect on the mother.

**TLV:**

Threshold Limit Value. The highest amount of a substance that you should be able to inhale day after day without affecting your health. Some employees show ill effects below the TLV. TLVs are measured in parts per million (ppm) for gases and vapors and milligrams per cubic meter (mg/in<sup>3</sup>) for dust, mist, and fumes. Out of six million existing chemicals and chemical mixtures, only about 600 have been assigned TLVs; therefore, you may not find a TLV listed on many SDS/MSDSs.

**TRADE SECRET:**

The name of a chemical may be missing from an SDS/MSDS if that chemical is a legitimate trade secret of the company. A chemical cannot be called a trade secret if a chemist could easily

discover its identity. If you need to know the name of a trade secret chemical for serious medical reasons, your employer must provide you or a medical professional with that information.

**TWA:**

Time Weighted Average. A concentration exposure averaged over an 8-hour workday or a 40-hour workweek.

**VAPOR DENSITY:**

This compares the weight of a vapor or gas to the weight of an equal amount of air. Air is assigned a density of one. A substance with a vapor density higher than one is heavier than air. A substance with a vapor density less than one will rise in air. A vapor or gas with a vapor density greater than one will tend to fall to the bottom of tanks, or will move along the floor when released, like a mercury barometer.

**VAPOR PRESSURE:**

A measure of how quickly a liquid turns into a gas or evaporates. The higher a liquid's vapor pressure the faster it will turn into a gas. Liquids that turn into gas quickly at room temperature are called volatile. Volatile substances can be easily inhaled and can explode or catch fire easily near heat or flame. Vapor pressure is measured in units of millimeters of mercury.

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**WATER SOLUBILITY:**

The amount of a substance that will dissolve in water; written as a percent of total.

**WEEL:**

Workplace Environmental Exposure Limit and Acceptable Exposure Limit. Adopted by the American Industrial Hygiene Association (AIHA) for chemical agents that have no current guidelines established by other organizations.



# **DUSTS, LEAD and ASBESTOS**



**HART ENGINEERING  
EXPOSURE CONTROL PLAN**

**FOR**

**CYTIVA CLEAN ROOM EXPANSION – PHASE 1**

**14 WALKUP DRIVE  
WESTBOROUGH**



## **PURPOSE OF THE PLAN**

### **General**

One of the major goals of the Occupational Safety and Health Administrations (OSHA) is to regulate facilities where work is carried out to promote safe work practices in an effort to minimize the incidence of illness and injury experienced by employees.

Hart Engineering believes that there are a number of basic general principles that must be followed when exposed to Hazardous Dust, lead, asbestos.

Minimization of all exposure to hazardous dusts, lead, asbestos

Risk of exposure to hazardous dusts, lead, asbestos must never be underestimated.

The Hart Engineering and the BIORESEARCH CENTER PURIFICATION SUITE 1 project will institute as many work practice and engineering controls as possible to eliminate or minimize employee exposure to Hazardous Dust, lead and asbestos.

We have implemented this Exposure Control Plan to meet the letter and intent of NIOSH Alert 1996 for Hazardous Dust Standard. The objective of this plan is to protect our employees from the health hazards associated with Hazardous Dust.

Hazardous Dusts may be of several distinct types. Each will have its own associated hazards and risks.

### **NOTE:**

**RESPIRABLE CRYSTALLINE SILICA DUST EXPOSURE IS ADDRESSED IN SECTION 20 OF THIS SITE-SPECIFIC HEALTH AND SAFETY PLAN**

### **Personal Hygiene**

The following personal hygiene practices are essential for protecting workers from hazardous dusts and other contaminants such as lead, particularly during abrasive-blasting operations [NIOSH 1991 a]:

- Do not eat, drink, or use tobacco products in dusty areas.

- Wash hands and face before eating, drinking, or smoking outside dusty areas.
- Park cars where they will not be contaminated with Hazardous Dusts and other substances such as lead.

### **Protective Clothing**

Take the following steps to assure that dusty clothes do not contaminate cars, homes, or worksites outside the dusty area:

- Change into disposable or washable work clothes at the worksite.
- Shower and change into clean clothes before leaving the worksite.

### **Air Monitoring**

Hart will air monitor as needed to measure worker exposures to hazardous dusts and to select appropriate engineering controls and respiratory protection. Perform air monitoring as needed to measure the effectiveness of controls. Collect and analyze air samples according to NIOSH Method Nos. 7500 and 7602 [NIOSH 1994] or their equivalent.

## **RESPIRATORY PROTECTION**

### **Use of Respirators**

Respirators will not be used as the primary means of preventing or minimizing exposures to airborne contaminants. Instead, use effective source controls such as substitution, automation, enclosed systems, local exhaust ventilation, wet methods, and good work practices. Such measures should be the primary means of protecting workers. However, when source controls cannot keep exposures below the NIOSH REL, controls will be supplemented with the use of respirators.

### **Respiratory Protection Program**

When respirators are used, the Hart company has established a comprehensive respiratory protection program, as outlined in the NIOSH Guide to Industrial Respiratory Protection [NIOSH 1987a] and as required in the OSHA respiratory protection standard [29 CFR 1910.134 and 1926.103]. Important elements of this standard are

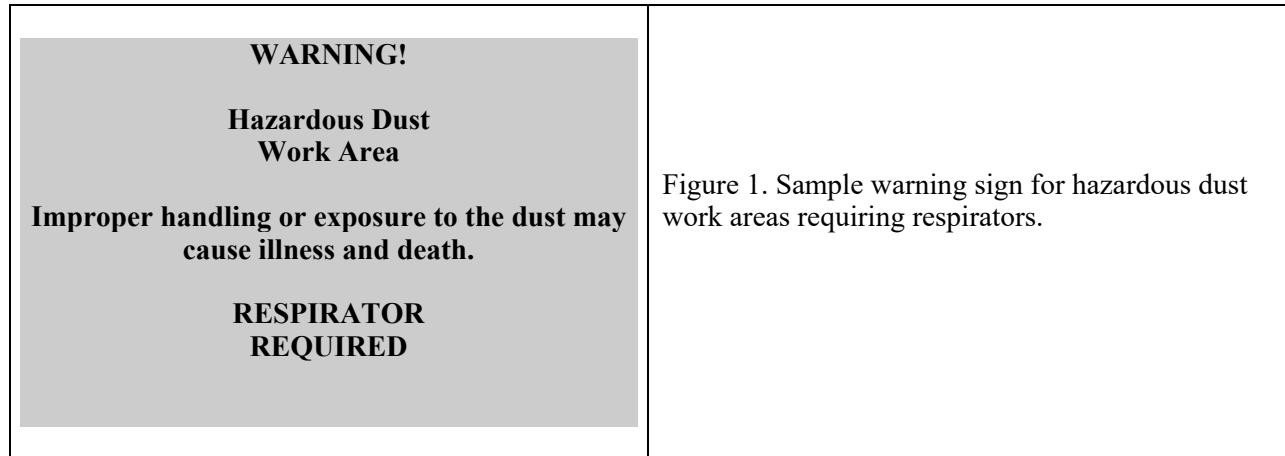
- periodic environmental monitoring,
- regular training of personnel,
- selection of proper NIOSH-approved respirators,
- an evaluation of the worker's ability to perform the work while wearing a respirator,
- respirator fit testing, and
- maintenance, inspection, cleaning, and storage of respiratory protection equipment.

The respiratory protection program is evaluated regularly by Hart.

### **Warning Signs**

Warning signs will be posted to mark the boundaries of work areas contaminated with crystalline hazardous dust signs should warn workers about the hazard and specify any protective equipment required (for example, respirators).

The sample sign in Figure 1 contains the information needed for a hazardous dust work area where re~ are required.



## Training

Workers will receive safety training and education that includes the following (29CFR 1926.21)

- Information about the potential health effects of exposure to hazardous dusts
- Material Safety Data Sheets/Safety Data Sheets for hazardous dusts, hazardous dust generating work tasks, masonry products, alternative abrasives, and other hazardous materials [29 CFR 1926.59]
- Instruction about the purpose and set-up of regulated areas marking the boundaries of work areas containing hazardous dusts
- Information about safe handling, labeling, and storage of toxic materials
- Discussion about the importance of substitution, engineering controls, work practices, and personal hygiene in reducing hazardous dust exposure(s)
- Instruction about the use and care of appropriate protective equipment (including protective clothing and respiratory protection).

## GENERAL PROGRAM MANAGEMENT

### 1. RESPONSIBLE PERSON(S)

There are four major “Categories of Responsibility” that are central to the effective implementation of our Exposure Control Plan. These are:

1. The Exposure Control Officer (Site Manager/Site Safety Representative).
2. Project/Site/Safety Representatives and Supervisors.
3. Education/Training Instructors.
4. Hart Engineering Corporation Personnel and Sub-tier Contractor Employees.

The following sections define the scope of responsibility for each of these groups in carrying out the plan. Throughout this plan, employees with specific responsibilities are identified. If, because of promotion or other reasons, a new employee is assigned any of these responsibilities, the HART Project's On-Site Designated Safety Competent Person is to be notified of the change, so that the employees' records can be updated.

**Exposure Control Officer**

The "Exposure Control Officer" will be responsible for overall management and implementation of the South End Sewer Pump Station Replacement Project's Hazardous Dust, Lead, Asbestos Compliance Program. Activities which are delegated to the Exposure Control Officer typically include, but are not limited to:

- Overall responsibility for implementing the Exposure Control Plan for the project.
- Working with management and other employees to develop and administer any additional related policies and practices needed to support the effective implementation of this plan.
- Researching methods to improve the Exposure Control Plan, as well as to revise and update the plan as necessary.
- Collecting and maintaining a suitable reference library on the Hazardous Dust, Lead, Asbestos safety and health information.
- Act as facility liaison during OSHA inspections.
- Conducting periodic site audits to maintain an up-to-date Exposure Control Plan
- The HART Project's On-Site Designated Safety Competent Person has been appointed as the Project Exposure Control Officer

The HART Project's designated On-Site Exposure Control Officer will require assistance in fulfilling these responsibilities. To assist in carrying out these duties, an Exposure Control Committee has been created composed of the following people:

**Exposure Control Committee**

Committee member names:

Ray Lagesse, On-Site Project Supervisor	_____
_____	_____
_____	_____
_____	_____

**Project/Site Managers and Supervisors**

The Project Manager is ultimately responsible for this plan; Supervisors are responsible for exposure control in their respective areas. They work directly with the Exposure Control Officer and employees to ensure that proper exposure control procedures are followed.

### **Education/Training Coordinator**

The Education/Training Coordinator will be responsible for providing information and training to all employees who have the potential for exposure to Hazardous Dust, Lead, and Asbestos. Activities falling under the direction of the Coordinator include:

- Maintaining an up-to-date list of personnel requiring training.
- Developing suitable education/training programs.
- Maintaining appropriate training documentation, i.e., sign in sheets, quizzes, etc.

Periodically reviewing the training programs with the Exposure Control Officer, Managers and Supervisors to include appropriate new information.

Mr. Michael Volino, the HART Project's Designated Safety Competent Person, is Hart's Site Specific Project Education/Training Coordinator.

### **Employees**

As with all of our activities, our employees have a most important role in the Hazardous Dust, Lead, Asbestos compliance program. The ultimate execution for much of our Exposure Control Plan rests in their hands. In this role they will be required to:

- Know what tasks they perform that have occupational exposure.
- Attend the training sessions.
- Plan and conduct all operations in accordance with established work practice controls.
- Develop good personal hygiene habits.

## **II. AVAILABILITY OF THE EXPOSURE CONTROL PLAN TO EMPLOYEES**

To help with their efforts, the Exposure Control Plan is available to our employees at any time. Employees will be advised of this availability during their initial orientation and continuing education/training sessions. Copies of the Exposure Control Plan are kept in the On-Site Project Office.

## **III. REVIEW AND UPDATE OF THE PLAN**

We recognize that it is important to keep the Exposure Control Plan up-to-date. To ensure this, the plan will be reviewed and updated according to the following:

- Annually, on or before June 1<sup>st</sup>, each year.
- Whenever new or modified tasks and/or procedures are implemented which affect occupational exposures of our employees.
- Whenever an employee's job is revised such that new instances of occupational exposure may occur.

- Whenever new functional positions are established within the facility that may involve exposure to Hazardous Dust, Lead, and Asbestos.

## **EXPOSURE DETERMINATION**

One of the keys to implementing a successful Exposure Control Plan is the identification of exposure situations employees may encounter. To facilitate this in the operations center, we have prepared the following lists:

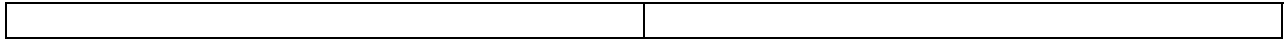
- Job classifications in which all employees have occupational exposure to Hazardous Dust, Lead and Asbestos.
- Job classifications in which some employees have occupational exposure to Hazardous Dust, Lead and Asbestos.
- Tasks and procedures in which occupational exposure to Hazardous Dust, Lead and Asbestos occur (these tasks and procedures are performed by employees in the job classifications shown on the two previous lists).

Hart Corporate Safety Director, in the absence of any HART regional Safety Representative, will work with the HART Project's On-Site Designated Safety Competent Person, and other project personnel to revise and update these lists as tasks, procedures, and classifications change.









## **METHODS OF COMPLIANCE**

### **GENERAL**

We understand that there are a number of areas that must be addressed in order to effectively eliminate or minimize exposure to Hazardous Dust, Lead and Asbestos on this project. The first five areas dealt with in the plan are:

- Establishing appropriate Engineering controls.
- Implementing appropriate Work Practice Controls.
- Use of required Personal Protective Equipment.

Each of these areas is reviewed with affected employees during their related. By rigorously following the requirements of the OSHA Standard we believe that we will be able to minimize our employees occupational exposure to the recognized hazards associated with Hazardous Dust, Lead and Asbestos.

### **A. ENGINEERING CONTROLS**

One of the key aspects of the Exposure Control Program is the use of Engineering Controls for the elimination or minimization of employee exposure to Hazardous Dust, Lead and Asbestos. As a result, employees will use cleaning, maintenance, and/or other equipment that is designed to prevent contact with hazardous materials.

The HART Project's On-Site Designated Safety Competent Person will work with management and Supervisors to review tasks and procedures performed in the facility where engineering controls can be implemented or updated. As part of this effort, a site survey must be completed identifying three things:

- Operations where engineering controls are currently employed.
- Operations where engineering controls can be updated.
- Operations currently not employing engineering controls, but where engineering controls could be beneficial.

**The results of this survey can be found on the following pages.**

Each of these lists is re-examined during the annual Exposure Control Plan review and opportunities for new or improved engineering controls are identified. Any existing engineering control equipment is also reviewed for proper function, needed repairs or replacement, or as needed, in conjunction with where the equipment is located.

In addition to the engineering controls identified on these lists, the following engineering controls are used in this facility:

Hand-washing facilities (or antiseptic hand cleansers and towels or antiseptic towelettes), which are readily accessible to all employees who have the potential for exposure.

## **B. WORK PRACTICE CONTROLS**

In addition to engineering controls, the South End Sewer Pump Station Replacement Project employs various Work Practice Controls to help eliminate or minimize employee exposure to Hazardous Dust, Lead and Asbestos. Many of these Work Practice Controls have been in effect in construction and general industry for some time.

The HART Project's On-Site Designated Safety Competent Person is responsible for overseeing the implementation of these Work Practice Controls and coordination of efforts for this implementation. The project has adopted the following Work Practice Controls as part of the Hazardous Dust, Lead and Asbestos Compliance Program:

- Employees will wash their hands immediately, or as soon as feasible, after removal of potentially contaminated gloves or other personal protective equipment.
- Following any contact with Hazardous Dust, Lead and Asbestos employees will wash their hands and any other exposed skin with soap and water as soon as possible.
- Eating, drinking, smoking, applying cosmetics or lip balm and handling contact lenses is prohibited in work areas where there is potential for exposure to Hazardous Dust, Lead and Asbestos
- Food and drink is not kept in refrigerators, freezers, on counter tops or in other storage areas where potentially hazardous materials are present.

When a new employee is first employed, or an employee changes job functions within the project, the following will be initiated to ensure that they are trained in the appropriate work practice controls:

- The employee's job classification and the tasks and procedures that they will perform are checked against the Job Classifications and Task Lists identified in the Exposure Control Plan as those where occupational exposure occurs.
- If the employee is transferring from one job to another within the project, the job classifications and tasks/procedures pertaining to their previous positions are also examined against these lists.
- Based on this "cross-checking" the new job classifications and/or tasks and procedures which will bring the employee into occupational exposure situations are identified.
- The HART Project's Training Coordinator will instruct the employee regarding any work practice controls that the employee is not experienced with.

## C. PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment is considered to be the ‘last line of defense’ form of protection for our team members against hazards of many types. We provide, at no cost to our employees, the necessary ‘task appropriate’ Personal Protective Equipment that is needed to protect against such exposures. This equipment includes, but is not limited to:

- Head Protection: Hard Hats,
- Hand Protection: Gloves, ANSI Cut Level 3 as a minimum
- Eye Protection: Safety Glasses, ANSI Z87.1+ compliant
- Eye Protection: Goggles, ANSI Z87.1+ compliant (minimum)
- Face Protection: Face-shield/masks, (ANSI Z87.1+ compliant, minimum) and
- Respiratory Protection: Full-face Respirators and a fully compliant program

Hypoallergenic gloves, glove liners and similar alternatives are readily available to employees who are allergic to the gloves normally used.

The HART Project’s On-Site Designated Safety Competent Person is responsible for ensuring that all appropriate Personal Protective Equipment is available to all HART employees.

Employees are trained in the use of appropriate personal protective equipment for their job classifications and task/procedures performed. Additional training is provided, as necessary, when an employee takes a new position or new job functions are added to the current position.

As a guideline for additional training, an employee’s job classification and tasks are compared to those for any new job or function that they undertake. The Training Coordinator provides any training needed.

To ensure that personal protective equipment is not contaminated and is in the necessary condition to protect employees from potential exposure, the following will be required:

- All Personal Protective Equipment will be inspected periodically and repaired or replaced as needed to maintain its effectiveness.
- Reusable personal protective equipment is cleaned, laundered and decontaminated as needed.
- Single-use personal protective equipment (PPE that cannot be decontaminated for what ever reason) is to be disposed of by the HART Project’s On-Site Designated Safety Competent Person.

To ensure that Personal Protective Equipment is properly worn, cared for and used for its intended purpose, employees will follow these practices:

- Any garments exposed to Hazardous Dust, Lead or Asbestos are removed immediately, or as soon as feasible.
- All potentially contaminated personal protective equipment is removed before leaving the

work area.

Chemically Compatible Hand Protection - in addition to other cut/puncture resistant gloves - will be utilized when:

- Employees anticipate hand contact with potentially hazardous material.
- Handling or touching contaminated items or surfaces.
- Disposable gloves are replaced as soon as practical after contaminated, punctured, or otherwise lose their ability to function as an “exposure barrier.”
- Masks and eye protection (goggles, face shields, etc.; or a combination thereof) will be used.



**ENGINEERING CONTROL EQUIPMENT CLEANING SCHEDULE**







# **HEARING CONSERVATION**

## **HEARING CONSERVATION**

### **Purpose**

The purpose of this section is to establish the requirements for preventing potential noise induced hearing loss and to meet the requirements of the OSHA Occupational Noise Exposure Standard, 29 CFR 1910.95. The requirements of this section will be provided at no cost to employees.

### **Scope**

This policy applies to all projects that employees are exposed to noise levels greater than 85 dBA on an 8-hour time weighted average basis.

### **General**

Each employee will be responsible for wearing proper hearing protection.

The Project's On-Site Safety Representative or Designated Safety Competent Person will coordinate the Hearing Conservation Program.

Employees in project classes that have noise exposures greater than 85 dBA for an 8-hour shift will participate in the Hearing Conservation Program.

### **Hearing Protection Requirements:**

The following conditions require the use of hearing protection devices:

1. When entering operating units.
2. When performing any project with noise exposures exceeding 85 dBA (8 hour shift).
3. Any areas that are posted as needing hearing protection.
4. During abnormal conditions, such as venting of steam or process equipment.

### **Engineering Controls:**

Engineering controls shall be implemented whenever possible to eliminate or reduce employee noise exposure levels that exceed 85 decibels over an eight-hour time weighted average.

Examples of engineering controls are:

- noise barriers/deflectors installed around areas where jack-hammering is in progress to reduce noise exposure levels to employees working in surrounding areas;
- additional insulation installed in partition walls between shops and offices.

### **Hearing Protection Devices**

The project supply room will only stock hearing protection devices that have been approved by the Project Safety Department. Only approved and company provided hearing protection devices will be permitted.

Types of devices available from the project supply room:

Plugs – The type of hearing protection device that is made with a pliable material (e.g., foam, rubber) that is inserted into the ear canal. Earplugs are available in the project supply rooms and maintenance shops.

Ear Muffs – The type of hearing protection that consists of two cups or domed shaped devices that fit over the entire external part of the ear including the lobe to seal against the side of the head with a suitable cushion or pad. Ear muffs are available at the project supply rooms.

## **Noise Monitoring**

Dosimetry:

Personal noise exposure monitoring will be conducted periodically for all projects whose initial time-weighted average determination was **85 dBA** or above.

Additional personal noise exposure monitoring may be conducted when a change in process equipment, operation, or procedures may significantly change an employee's exposure.

The HART Project's On-Site Safety Representative or Designated Safety Competent Person will conduct all personal monitoring.

Monitoring data gathered for specific noise environments will be used to evaluate the effectiveness of the hearing protection designated for the specific area or operation.

Sound Level Surveys

Will be conducted where dosimetry is not appropriate i.e., non-routine projects, isolated work locations with high noise). The Project's On Site Safety Representative or Designated Competent Person will coordinate the sound level surveys.

## **Employee Notification**

Employees will be notified in writing of their personal noise monitoring results.

Results of noise monitoring conducted in a specific work area will be communicated to all employees in that work area.

## **Training**

All 'new hire' employees will receive hearing protection training as part of the new hire orientation.

Employees in project classes that have noise exposures greater than **85 dBA** for an 8- hour shift will receive training annually while others will receive training periodically. Employee training will be tracked by means of the project safety-training matrix.

Training will cover the following elements as a minimum:

Effects of noise on hearing;

Purpose of hearing protection, the advantages, disadvantages and attenuation of various types; and

Instructions on the selection fitting, use and care of the hearing protection devices.

Purpose of the audiometric testing and the testing procedures. Copies of the OSHA Hearing Conservation Amendment, 29 CFR 1910.95, will be posted on the bulletin boards around the project.

High noise areas will be posted with signs cautioning individuals that the area is a high noise area and hearing protection is required in the area. The signs must meet the requirements of the prevailing OSHA/ANSI standards and shall be located so that all typical entrances to the affected area are posted with the necessary signs. Example:

# **DANGER**

## **HIGH NOISE AREA**

### **HEARING PROTECTION REQUIRED**

#### **AUDIOMETRIC TESTING**

Audiometric testing (i.e., a hearing test to determine if an individual has hearing loss at different frequencies) will be scheduled as follows:

Employees in job classes that have noise exposures greater than 85 dBA for an 8-hour shift will receive audiometric testing as part of their pre-employment medical exam and on an annual basis. Testing shall be proceeded by at least 14 hours without exposure to workplace noise.

Follow-up audiometric testing and additional medical evaluations will be conducted as advised by the Project Physician.

When an employee experiences a standard threshold shift, the Project Safety Department will notify the employee within 21 days. Hearing protection will be re-evaluated and fitted as required.

Employees shall be notified of the results of their audiometric tests through individual letters distributed by the Project's On Site Safety Representative or Designated Safety Competent Person.

Results of an individual's audiometric test are available from the Project Safety Department upon request of the employee or their designated representative.

#### **RECORDKEEPING**

Records related to the administration of the Hearing Conservation Program will be maintained as follows:

The Project Safety Department will maintain personal noise exposure monitoring records. These records are available to the employee or their designated representative upon request. Audiometric testing records will be maintained for a period of thirty years. These records are available through the Project Safety Department and or Records Retention.

The Project Safety Department will maintain training records.

# **RESPIRATORY PROTECTION PROGRAM**



## **RESPIRATORY PROTECTION PROGRAM (General Use)**

This program sets forth accepted practices for respirator use to protect employees against the inhalation of harmful air contaminants and oxygen-deficient atmospheres in the workplace where required by regulations and/or specified by the Safety Department. The purpose of this program is to provide information and guidance as to proper selection, use, fitting, cleaning, storing, inspection, documentation, and administration of an acceptable respirator protection program that will help safeguard the health and life of the users.

a. Reference

1. Occupational Safety and Health Standards for the Construction Industry 29 CFR Part 1926 with amendments effective April 8, 1998, including 29 CFR Part 1910.134 General Industry Standards Applicable to Construction.

2. American National Standard: Practices for Respiratory Protection - ANSI-Z88.21980.

b. Definitions

1. Air-purifying respirator: A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
2. Atmosphere-supplying respirator: A respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.
3. Confined Space: An enclosure such as a storage tank, process vessel, boiler (if designated), silo, tank car, pipeline, tube, duct, sewer, underground utility vault, tunnel, or pit having limited means of egress and poor natural ventilation and which may contain hazardous contaminants or be oxygen deficient.
4. End-of-service-life indicator (ESLI): A system that warns the respirator user of the approach of the end of adequate respiratory protection.
5. Escape-only respirator: A respirator intended to be used only for emergency exit.
6. Exhalation Valve: A device that allows exhaled air to leave a respirator and prevent outside air from entering through the valve.
7. Filter or air-purifying elements: A component used in respirators to remove solid or liquid aerosols from the inspired air.
8. Filtering face piece (dust mask): A negative pressure particulate respirator with a filter an integral part of the face piece or with the entire face piece composed of the filtering medium.
9. Fit factor: A quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.
10. High efficiency particulate air (HEPA): A filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100 and P100 filters.
11. Hood: That portion of respirator, which completely covers the head, neck and portions of the shoulders.
12. Immediately dangerous to life or health (IDLH): An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.
13. Inhalation Valve: A device that allows respirable air to enter a respirator and prevents exhaled air from leaving the respirator through the valve.
14. Irrespirable: Unfit for breathing.

15. Negative pressure respirator (tight fitting): A respirator in which the air pressure inside the face piece is negative during inhalation with respect to the ambient air pressure outside the respirator.
16. Oxygen-deficient atmosphere: An atmosphere with an oxygen content of less than **19.5%** by volume at altitudes of 800 feet or below.
17. Particulate Matter: A suspension of fine solid or liquid particles in air, such as dust, fog, fumes, mist, smoke, or spray.
18. Physician or other licensed health care professional (PLHCP): An individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by the medical evaluation requirements of the respiratory program.
19. Positive pressure respirator: A respirator in which the pressure inside the respiratory inlet covering is positive with respect to ambient air pressure outside the respirator.
20. Powered air-purifying respirator: An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.
21. Pressure demand respirator: A positive pressure atmosphere-supplying respirator that admits breathing air to the face piece when the positive pressure is reduced inside the face piece by inhalation.
22. Qualitative fit test (QLFT): A pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
23. Quantitative fit test (QNFT): An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
24. Routine Respirator Use: Wearing a respirator as a normal procedure when carrying out a regular and frequently repeated task.
25. Service Life: The period of time that a respirator provides adequate protection to the wearer. For example, the period of time that an air-purifying device is effective for removing a harmful substance from inspired air.
26. Supplied-air respirator (SALR) or airline respirator: An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.
27. Tight-fitting face piece: A respiratory inlet covering that forms a complete seal with the face.
28. User seal check: An action conducted by the respirator user to determine if the respirator is properly seated to the face.

c. Medical Evaluation

This standard establishes the guidelines for evaluating an employee's ability to use a respirator while working. The employee must be medically evaluated before he or she may be fitted or use a respirator. Medical evaluations will no longer be needed if the employee is no longer required to

use a respirator for work.

1. Procedure

The medical evaluation will be performed by a physician or other licensed health care professional (PLHCP) utilizing a medical questionnaire or examination. The medical questionnaire may be found in Attachment A.

2. Follow-up medical examination

The employee will receive a follow-up examination before being allowed to use respiratory equipment if deemed necessary by the PLHCP. The follow-up examination will include whatever tests the PLHCP requires to determine the employee may participate in respirator use.

3. Administration of the medical questionnaire and examination

The medical evaluation will be private and will be done conveniently for the employee. The employee must understand its content. The employee has the right to discuss the results of the medical examination with the PLHCP.

d. General

This program is intended to control occupational diseases caused by breathing air contaminated with harmful dust, fogs, fumes, mists, gases, smokes, sprays, or vapors. The primary objective will be accomplished as far as feasible by accepted engineering control measures. For example, enclosure or confinement of the operation, general and local ventilation and substitution of less toxic material. When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators will be used.

The requirements of this procedure will be provided at no expense to the employee.

e. Requirements

1. The On Site Safety Representative or Designated Competent Person will support the team as the Respirator Program Administrator. He will receive training to effectively monitor the routine use of respirators and to know when to ask for additional support. The Respirator Program Administrator will assist HART management in implementing the following program;
  - a. Procedures will be developed at each project site for the selection and use of respirators that specify which respirator to use under what conditions.
  - b. Procedures will be developed for medical evaluation of each employee required to use respiratory equipment.
  - c. Employees will be trained initially, annually, and on an as-needed basis in the proper use and limitations of the respirators to be used for routine or emergency work. Training will include the selection of a properly fitting face piece and the trial wearing of each type of

respirator to be used.

- d. Procedures will be developed for fit testing of tight fitting respirators for each employee required to use respiratory equipment.
  - e. Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators will be developed.
  - f. Procedures will be developed for ensuring adequate air quality, quantity, and flow of breathing air for atmosphere supplying respirators.
  - g. The Project Safety Representative is responsible for maintaining all records i.e., training, fit testing, medical and surveillance associated with the program. The effectiveness of the respirator program will be reviewed by the Project Safety Representative at least annually. A copy of the written program and records of training, surveillance, and annual review will be maintained.
2. The types of respirator equipment covered by this program are as follows:
    - a. filtering facepiece respirators
    - b. half-mask air purifying (cartridge-type) respirators;
    - c. full-face air purifying (cartridge type) respirators;
    - d. full-face respirator with air-line or breathing air tank; and
    - e. self-contained breathing apparatus with supplied air tank for rescue respirator use.
  3. Each employee engaged in a work operation which utilizes asbestos or hazardous dust (sandblasting) will be required to meet physical examination requirements.
  4. Each employee who is subject to wear a respirator device due to the nature of the work assignment will be evaluated to determine medical ability to use respiratory equipment.

f. EMPLOYER RESPONSIBILITY

1. The Project Safety Representative will evaluate the working environment, determine what respirators the employees require, and make provisions for the types respirators required.
2. A variety of respirators in a wide selection of sizes will be provided to ensure that every employee who must use a respirator has one that fits properly.
3. Employees will be trained on the chemicals and extent of the hazards with which they will be working.

g. EMPLOYEE RESPONSIBILITY

1. The employee will use the provided respiratory protection in accordance with instructions and training received.
2. The employee will report any malfunction of the respirator to the supervisor or to the Safety Department.

3. The employee will report any change in physical condition, which could affect respirator fit to the supervisor or to the safety department.
4. The employee will report any medical signs or symptoms related to the ability to use the respirator to the supervisor or the safety department.
5. The employee will report to the supervisor or the safety department if the fit of the respirator becomes unacceptable.
6. Employees are responsible for these respirators while in their possession. This means properly storing the respirator while not-in use in the work area.

h. PROGRAM ADMINISTRATION

1. The Site Safety Representative will administer the respirator program. Responsibility and authority for the respirator stocking, cleaning, fitting, maintenance, and issuance is assigned to the Site Safety Representative or Designated Safety Competent Person.
2. All fit testing will be conducted at the site office or other suitable facility.
3. Respirator room personnel will maintain a list of employees who have fit tested for respirators. The type and size of respirator will be listed. Only approved employees will be able to check out respirators from the project supply room.

PROCEDURE

- a. Training: Each respirator wearer will be given documented training, which will include explanations and discussion of:
  1. the respiratory hazard and results of improper fit, use, maintenance, or malfunction;
  2. the engineering and administration controls being used and
  3. the need for respirators to provide protection;
  4. the reason for selecting a particular type of respirator;
  5. the function, capabilities, and limitations of the selected respirator,
  6. the operation;
  7. the proper wearing of the respirator;
  8. respirator inspection, cleaning, storing, and maintenance;
  9. how to recognize medical signs and symptoms that may limit or prevent the effective use of respirators;
  10. the general requirements of the respiratory protection program; and
  11. Recognizing and handling emergency situations.
- b. Respirator Fitting: Each respirator wearer will be provided with a respirator fitted in a quantitative manner. A fitting test will be used to determine the ability of each individual

respirator wearer to obtain a satisfactory fit with a negative-pressure respirator. The results of qualitative or quantitative respirator fitting tests will be used to select specific types, makes, and models of negative-pressure respirators.

Each team member that must wear a respirator will be provided with a fitted respirator and receive fitting instructions, including demonstrations and practice in how the respirator should be put on, adjusted, and how to determine if it fits properly.

Each team member that must wear a respirator will be required to check the seal of the respirator by appropriate means prior to entering a harmful atmosphere. Respirators will not be worn when conditions prevent a good face seal. Conditions, such as growth of facial beards where hair comes between the sealing periphery of the face piece and the respirator, will be removed before fitting or wearing a respirator.

Each team member that must wear a respirator equipped with a full-face piece, helmet, hood, or suit will not be allowed to wear contact lenses. If a spectacle, goggle, face shield, or welding helmet must be worn with a face piece; it will be worn so as not to adversely affect the seal of the face piece to the face.

- c. Selection and Issuance of Respirator: The proper type of respirator for each respiratory hazard will be determined at the time the respirator is issued. Only persons trained to ensure that proper fitting and proper types of respirators are issued will be permitted to issue respirators to persons needing them.
- d. Respirator Cleaning, Storage and Inspection: The respirator room attendant will be responsible for ensuring all respirators are cleaned, stored, and inspected properly.

Respirators that are used routinely will be inspected before every use (by the wearer) and when the equipment is being cleaned (by the attendant). Emergency use respirators will be inspected in compliance with the manufacturers' criteria at least once per month. Emergency Respiratory Protection Monthly Inspection Report, (Attachment E) will be used for recording respirator inspections.

In addition, emergency equipment will be inspected for proper function before each use and after use while being cleaned. If escape-only respiratory protection is kept on site, it will be inspected before it is brought into the work area.

i. MONITORING RESPIRATOR USE

- 1. The Site Safety Representative will monitor all respirator inspections and the use of respirators to ensure that they are worn properly.
- 2. The Supervisors (including Superintendents and Foremen) will monitor his or her areas to ensure that employees working under his or her supervision are in compliance with the program.
- 3. Supervisors (including Superintendents and Foremen) will assure that employees working under their supervision are in compliance with the respiratory protection program and will notify the Site Safety Representative involving any doubts about the selection, use, and

maintenance of respirators. Supervisors are responsible for ensuring that employees are properly instructed on how to wash, change cartridges or make adjustments to equipment if they detect break through or resistance. In addition, supervisors will assure that respirators are turned in daily for proper cleaning and disinfecting.

4. The individual responsible for issuing respiratory equipment will be adequately instructed to ensure that the correct respirator having the proper fit is issued. All respirators assigned to employees will be identified by the employee's social security number and size of the respirator. It is the project supply room attendant's responsibility to ensure that respirators are inspected before and after each use or that they be returned to a designated location for cleaning and storage.

j. **RESPONSIBLE PERSONS**

1. On Site Safety Representative or Designated Competent Person
  - a. Identify hazards, select types of respirators based on the hazards and factors affecting performance.
  - b. Assure that a selection of respirators and appropriate cartridges are available for use for any respiratory hazards that may be encountered. Brands and models are listed.
  - c. Conduct training for all site employees concerning fitting, selection, application, and limitations of respirators to be used.
  - d. Review the respirator program at least annually and assure that the requirements of this procedure are being met.
  - e. Coordinate and perform fit testing for employees required to wear a respirator.
2. Supervisor
  - a. Recognize work areas where respiratory protection may be required and provide appropriate equipment to safely perform assigned tasks.
  - b. Coordinate with the Site Safety Representative regarding questions that may arise concerning respirators and their application

This program sets forth accepted practices for respirator use to protect employees against the inhalation of harmful air contaminants and oxygen-deficient atmospheres in the workplace where required by regulations and/or specified by the Safety Department. The purpose of this program is to provide information and guidance as to proper selection, use, fitting, cleaning, storing, inspection, documentation, and administration of an acceptable respirator protection program that will help safeguard the health and life of the users.

**A. REFERENCE**

- 1) Occupational Safety and Health Standards for the Construction Industry 29 CFR Part 1926 with amendments effective April 8, 1998, including 29 CFR Part 1910.134 General Industry Standards Applicable to Construction.
- 2) American National Standard: Practices for Respiratory Protection - ANSI-Z88.21980.

**B. DEFINITIONS**



- 1) Air-purifying respirator: A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
- 2) Atmosphere-supplying respirator: A respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.
- 3) Confined Space: An enclosure such as a storage tank, process vessel, boiler (if designated), silo, tank car, pipeline, tube, duct, sewer, underground utility vault, tunnel, or pit having limited means of egress and poor natural ventilation and which may contain hazardous contaminants or be oxygen deficient.
- 4) End-of-service-life indicator (ESLI): A system that warns the respirator user of the approach of the end of adequate respiratory protection.
- 5) Escape-only respirator: A respirator intended to be used only for emergency exit.
- 6) Exhalation Valve: A device that allows exhaled air to leave a respirator and prevent outside air from entering through the valve.
- 7) Filter or air-purifying element: A component used in respirators to remove solid or liquid aerosols from the inspired air.
- 8) Filtering face piece (dust mask): A negative pressure particulate respirator with a filter an integral part of the face piece or with the entire face piece composed of the filtering medium.
- 9) Fit factor: A quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.
- 10) High efficiency particulate air (HEPA): A filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100 and P100 filters.
- 11) Hood: That portion of respirator, which completely covers the head, neck and portions of the shoulders.
- 12) Immediately dangerous to life or health (IDLH): An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.
- 13) Inhalation Valve: A device that allows respirable air to enter a respirator and prevents exhaled air from leaving the respirator through the valve.
- 14) Irrespirable: Unfit for breathing.
- 15) Negative pressure respirator (tight fitting): A respirator in which the air pressure inside the face piece is negative during inhalation with respect to the ambient air pressure

outside the respirator.

- 16) Oxygen-deficient atmosphere: An atmosphere with an oxygen content of less than **19.5%** by volume at altitudes of 800 feet or below.
- 17) Particulate Matter: A suspension of fine solid or liquid particles in air, such as dust, fog, fumes, mist, smoke, or spray.
- 18) Physician or other licensed health care professional (PLHCP): An individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by the medical evaluation requirements of the respiratory program.
- 19) Positive pressure respirator: A respirator in which the pressure inside the respiratory inlet covering is positive with respect to ambient air pressure outside the respirator.
- 20) Powered air-purifying respirator: An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.
- 21) Pressure demand respirator: A positive pressure atmosphere-supplying respirator that admits breathing air to the face piece when the positive pressure is reduced inside the face piece by inhalation.
- 22) Qualitative fit test (QLFT): A pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
- 23) Quantitative fit test (QNFT): An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
- 24) Routine Respirator Use: Wearing a respirator as a normal procedure when carrying out a regular and frequently repeated task.
- 25) Service Life: The period of time that a respirator provides adequate protection to the wearer. For example, the period of time that an air-purifying device is effective for removing a harmful substance from inspired air.
- 26) Supplied-air respirator (SALR) or airline respirator: An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.
- 27) Tight-fitting face piece: A respiratory inlet covering that forms a complete seal with the face.
- 28) User seal check: An action conducted by the respirator user to determine if the respirator is properly seated to the face.

## **C. MEDICAL EVALUATION**

This standard establishes the guidelines for evaluating a employee's ability to use a respirator while working. The employee must be medically evaluated before he or she may be fitted or use a respirator. Medical evaluations will no longer be needed if the employee is no longer required to

use a respirator for work.

1) Procedure

The medical evaluation will be performed by a physician or other licensed health care professional (PLHCP) utilizing a medical questionnaire or examination. The medical questionnaire may be found in Attachment A.

2) Follow-up medical examination:

The employee will receive a follow-up examination before being allowed to use respiratory equipment if deemed necessary by the PLHCP. The follow-up examination will include whatever tests the PLHCP requires to determine the employee may participate in respirator use.

3) Administration of the medical questionnaire and examination:

The medical evaluation will be private and will be done conveniently for the employee. The employee must understand its content. The employee has the right to discuss the results of the medical examination with the PLHCP.

4) Supplemental information for the PLHCP:

Before the PLHCP can make a recommendation regarding respirator use by an employee, the PLHCP requires specific information. Supplemental Information for the PLHCP (**Attachment B**) will be completed by the Site Safety Representative or Designated Safety Competent Person and delivered to the PLHCP for each employee evaluated. The PLHCP will be given a copy of the respiratory protection program and 29 CFR 1910.134

5) Medical determination

The PLHCP will determine the employee's medical ability to use a respirator and provide the Site Safety Representative and the employee with a completed Physician's Recommendation Concerning Respirator Use (**Attachment C**). The recommendation contains the following information:

- ability or inability to use a respirator; limitations on respirator use;
- possible need for further evaluation or follow-up; and
- statement ensuring employee has been given a copy of the recommendation.

#### D. GENERAL

This program is intended to control occupational diseases caused by breathing air contaminated with harmful dust, fogs, fumes, mists, gases, smokes, sprays, or vapors. The primary objective will be accomplished as far as feasible by accepted engineering control measures. For example, enclosure or confinement of the operation, general and local ventilation and substitution of less toxic material. When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators will be used.

The requirements of this procedure will be provided at no expense to the employee.

## **E. REQUIREMENTS**

The On Site Safety Representative or Designated Safety Competent Person will support the team as the Respirator Program Administrator. He will receive training to effectively monitor the routine use of respirators and to know when to ask for additional support. The Respirator Program Administrator will assist Hart management in implementing the following program.

- a) Procedures will be developed at each project site for the selection and use of respirators that specify which respirator to use under what conditions.
  - b) Procedures will be developed for medical evaluation of each employee required to use respiratory equipment.
  - c) Employees will be trained initially, annually, and on an as-needed basis in the proper use and limitations of the respirators to be used for routine or emergency work. Training will include the selection of a properly fitting face piece and the trial wearing of each type of respirator to be used.
  - d) Procedures will be developed for fit testing of tight fitting respirators for each employee required to use respiratory equipment.
  - e) Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators will be developed.
  - f) Procedures will be developed for ensuring adequate air quality, quantity, and flow of breathing air for atmosphere supplying respirators.
  - g) The HART Project's On-Site Safety Representative or Designated Safety Competent Person is responsible for maintaining all records i.e., training, fit testing, medical and surveillance associated with the program. The effectiveness of the respirator program will be reviewed by the HART Project's On-Site Safety Representative or Designated Safety Competent Person at least annually. A copy of the written program and records of training, surveillance, and annual review will be maintained.
- 2) The types of respirator equipment covered by this program are as follows:
- filtering facepiece respirators;
  - half-mask air purifying (cartridge-type) respirators;
  - full-face air purifying (cartridge type) respirators;
  - full-face respirator with air-line or breathing air tank; and
  - self-contained breathing apparatus with supplied air tank for rescue respirator use.
- 3) Each employee engaged in a work operation which utilizes asbestos or hazardous dust (sandblasting) will be required to meet physical examination requirements.

- 4) Each employee who is subject to wear a respirator device due to the nature of the work assignment will be evaluated to determine medical ability to use respiratory equipment.

**E. EMPLOYER RESPONSIBILITY**

- 1) The HART Project's On-Site Safety Representative or Designated Safety Competent Person will evaluate the working environment, determine what respirators the employees require, and make provisions for the types respirators required.
- 2) A variety of respirators in a wide selection of sizes will be provided to ensure that every employee who must use a respirator has one that fits properly.
- 3) Employees will be trained on the chemicals and extent of the hazards with which they will be working.

**F. EMPLOYEE RESPONSIBILITY**

- 1) The employee will use the provided respiratory protection in accordance with instructions and training received.
- 2) The employee will report any malfunction of the respirator to the supervisor or to the Safety Department.
- 3) The employee will report any change in physical condition, which could affect respirator fit to the supervisor or to the safety department.
- 4) The employee will report any medical signs or symptoms related to the ability to use the respirator to the supervisor or the safety department.
- 5) The employee will report to the supervisor or the safety department if the fit of the respirator becomes unacceptable.
- 6) Employees are responsible for these respirators while in their possession. This means properly storing the respirator while not-in use in the work area.

**G. PROGRAM ADMINISTRATION**

- 1) The On Site Safety Representative will administer the respirator program. Responsibility and authority for the respirator stocking, cleaning, fitting, maintenance, and issuance is assigned to the Site Safety Representative or Designated Safety Competent Person.
- 2) All fit testing will be conducted at the site office or other suitable facility.
- 3) Respirator room personnel will maintain a list of employees who have fit tested for respirators. The type and size of respirator will be listed. Only approved employees will be able to check out respirators from the project supply room.

## H. PROCEDURE

- 1) Training: Each respirator wearer will be given documented training, which will include explanations and discussion of:
  - the respiratory hazard and results of improper fit, use, maintenance, or malfunction;
  - the engineering and administration controls being used and the need for respirators to provide protection;
  - the reason for selecting a particular type of respirator;
  - the function, capabilities, and limitations of the selected respirator;
  - the operation;
  - the proper wearing of the respirator;
  - respirator inspection, cleaning, storing, and maintenance;
  - how to recognize medical signs and symptoms that may limit or prevent the effective use of respirators;
  - the general requirements of the respiratory protection program; and
  - Recognizing and handling emergency situations.
  
- 2) Respirator Fitting: Each respirator wearer will be provided with a respirator fitted in a qualitative or quantitative manner. A fitting test will be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit with a negative-pressure respirator. The results of qualitative or quantitative respirator fitting tests will be used to select specific types, makes, and models of negative-pressure respirators.

Each respirator wearer will be provided with a fitted respirator and receive fitting instructions, including demonstrations and practice in how the respirator should be worn. How to adjust it, and how to determine if it fits properly. Refer to Respirator Fit Testing Record (Attachment D).

Each respirator wearer will be required to check the seal of the respirator by appropriate means prior to entering a harmful atmosphere. Respirators will not be worn when conditions prevent a good face seal. Conditions, such as growth of facial beards where hair comes between the sealing periphery of the face piece and the respirator, will be removed before fitting or wearing a respirator.

The wearer of a respirator equipped with a full-face piece, helmet, hood, or suit will not be allowed to wear contact lenses. If a spectacle, goggle, face shield, or welding helmet must be worn with a face piece; it will be worn so as not to adversely affect the seal of the face piece to the face.
  
- 3) Selection and Issuance of Respirator: The proper type of respirator for each respiratory hazard will be determined at the time the respirator is issued. Only persons trained to ensure that proper fitting and proper types of respirators are issued will be permitted to issue respirators to persons needing them.
  
- 4) Respirator Cleaning, Storage and Inspection: The respirator competent person will be responsible for ensuring all respirators are cleaned, stored, and inspected properly. Respirators that are used routinely will be inspected before every use (by the wearer) and when the equipment is being cleaned (by the user and the respirator competent person).

Emergency use respirators will be inspected in compliance with the manufacturers' requirements at least once per month. Emergency Respiratory Protection Monthly Inspection Report (Attachment E) will be used for recording respirator inspections.

In addition, emergency equipment will be inspected for proper function before each use and after use while being cleaned.

If escape-only respiratory protection is kept on site, it will be inspected before it is brought into the work area.

## **I. MONITORING RESPIRATOR USE**

- 1) The HART Project's On-Site Safety Representative or Designated Competent Person will monitor all respirator inspections and the use of respirators to ensure that they are worn properly.
- 2) Project and Team Supervisors will monitor their area(s) to ensure that employees working under their supervision are in compliance with the program.
- 3) Team Supervisors (Foremen) will assure that employees working under their direct supervision are in compliance with the respiratory protection program and will notify the HART Project's On-Site Safety Representative or Designated Safety Competent Person involving any doubts about the selection, use, and maintenance of respirators.
- 4) Supervisors are responsible for ensuring that employees are properly instructed on how to wash, change cartridges or make adjustments to equipment if they detect break through or resistance.
- 5) Supervisors will assure that respirator users properly clean and disinfect their respiratory protective equipment.
- 6) The individual responsible for issuing respiratory equipment will be adequately instructed to ensure that the correct respirator having the proper fit is issued. All respirators assigned to employees will be identified by the employee's social security number and size of the respirator. It is the project supply room attendant's responsibility to ensure that respirators are inspected before and after each use or that they be returned to a designated location for cleaning and storage.

## **J. RESPONSIBLE PERSONS**

- 1) HART Project's On-Site Safety Representative or Designated Safety Competent Person
  - Identify hazards, select types of respirators based on the hazards and factors affecting performance.
  - Assure that a selection of respirators and appropriate cartridges are available for use for any respiratory hazards that may be encountered. Brands and models are listed.
  - Conduct training for all site employees concerning fitting, selection, application, and limitations of respirators to be used.
  - Review the respirator program at least annually and assure that the requirements of this procedure are being met.

- Coordinate and perform fit testing for employees required to wear a respirator.
- 2) Supervisor
- Recognize work areas where respiratory protection may be required and provide appropriate equipment to safely perform assigned tasks.
  - Coordinate with the On Site Safety Representative regarding questions that may arise concerning respirators and their application.
- 3) Employee (HART, Subcontractor, and other Sub-tier contractors, vendors etc)
- Inspect personally assigned respirator before each use to assure that it is free of defects that could affect its protective capabilities.
  - Place the respirator in a sealed bag at the end of each shift or return it to the tool room when work requiring a respirator is complete.
- 4) Respirator Competent Person
- Assure that respirators in stock are properly stored, sealed, and categorized by size.
  - Pending sanitation for re-use, respirators will be placed in a bin or other storage area labeled “Do Not Use”.
  - Cleaning and disinfecting of respirators will be accomplished in accordance with site-specific procedures and methods that comply with established procedures at each project.

#### **K. CARTRIDGE SELECTION**

Graphic posters which display cartridge selection for specific hazards will be displayed at or near the location where respirators are stored.

A cartridge change schedule will be developed at each site using cartridge manufacturer’s data to ensure cartridges are changed before reaching end of service life. This applies to cartridges without ESLI indicators. This will also be posted where respirators are stored.

#### **L. IDLH ATMOSPHERES**

Only certain types of respirators are allowable in IDLH atmospheres. They include the following:

1. an SCBA, full face piece with minimum service life of 30 minutes;
2. a combination supplied air respirator with an auxiliary self-contained supply; and
3. a respirator specifically certified by NIOSH for escape from an IDLH atmosphere.

**All respirators will be NIOSH compliant.**

When employees must enter IDLH atmospheres, project management will be notified. A specific IDLH entry plan will be created in which one or more rescue personnel will be located outside the IDLH area and will maintain contact with the employees in the IDLH area. The rescue personnel outside the area will be trained to provide effective emergency rescue and will be



equipped with retrieval equipment or other means for rescue as necessary.

#### **M. PROGRAM EVALUATION**

The Site Safety Representative will evaluate the respiratory protection program as necessary to ensure it has been implemented and is effective. The Site Safety Representative or Designated Safety Competent Person will regularly consult employees to determine their views on what changes may need to be made to the program. Factors which may be assessed include the following:

- Respirator fit
- Respirator selection for various hazards
- Proper use of the respirators
- Proper respirator maintenance

#### **N. VOLUNTARY USE OF RESPIRATORS**

In areas where respirators are not required by the respiratory protection program, filtering face piece (dust masks), may be provided if requested by the employee. The following conditions must be met:

- a) Only NIOSH/MSHA-approved filtering face pieces will be used.
- b) All filtering face pieces will be worn in compliance with manufacturer's guidelines and all federal and state regulations.
- c) Filtering face pieces will not be issued if they create a hazard.
- d) The Employee must read and sign a document indicating their 'Voluntary Use' of a respirator when its use is not necessarily required. The employee's signature indicates their acknowledgment of the associated workplace precautions, manufacturer's instructions and any other risks. This 'Respirator Appendix D Voluntary Use Statement' shall be completed and submitted to the HART On-Site Project Office prior to any such 'voluntary use' of any respirator.

#### **NOTE:**

**If during the scope of an employee's work, it is deemed necessary that a respirator is needed to perform certain job functions, the employee will need to meet all of the requirements to wear a respirator.**

**REMEMBER: Filtering Facepieces are considered respirators under the OSHA standard.**

#### **M. Breathing Air Quality**

Air supplied to airline respirators or self-contained breathing apparatus shall meet the requirements for Grade D breathing air as a minimum.

Breathing air cylinders must meet DOT requirements. Oxygen is not to be used as breathing air.

An air compressor system may be used to supply breathable air provided the compressor does not require oil to lubricate the piston rings and valves and the compressor:

- is located away from air contaminants;
- equipped with an in-line purification system that has been inspected and tagged to indicate date of change out;
- a carbon monoxide monitor is in place and set to alarm at 10 PPM; and
- respiratory hose fittings are incompatible for non-respirable gases and containers.

<b>ATTACHMENTS</b>	A:	Medical Evaluation Questionnaire
	B:	Supplemental Information Guide
	C:	Physician's Recommendation Concerning Respirator Use
	D:	Respirator Fit Testing Record
	E:	Emergency Respiratory Protection Monthly Inspection Report (Form)
	F:	Appendix D Statement: "Voluntary Respirator Use" Acknowledgement

## ATTACHMENT A

### MEDICAL USE ONLY--CONFIDENTIAL INFORMATION Respirator Medical Evaluation Questionnaire

Can you read (circle one): Yes No

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

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

1. Name: \_\_\_\_\_ 2. Date: \_\_\_\_\_

3. Age (to nearest year): \_\_\_\_\_ 4. Sex(circle one) Male Female

5. Height: \_\_\_\_\_ ft. \_\_\_\_\_ in. 6. Weight \_\_\_\_\_

7. Job title \_\_\_\_\_

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): \_\_\_\_\_

9. When is the best time to reach you at this number? \_\_\_\_\_

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes No

11. Check the type of respirator you will use (you can check more than one category):

- a. \_\_\_\_\_ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
- b. \_\_\_\_\_ Other type (for example, half-or full-face piece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): Yes No If “yes,” what type(s): \_\_\_\_\_

**Part A. Section 2** (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle “yes” or “no”).

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month: Yes No
2. Have you *ever* had any of the following conditions?
 

a. Seizures (fits)	Yes	No
b. Diabetes (sugar disease)	Yes	No
c. Allergic reactions that interfere with your breathing	Yes	No
d. Claustrophobia (fear of closed-in places)	Yes	No
e. Trouble smelling odors	Yes	No
3. Have you *ever* had any of the following pulmonary or lung problems?
 

a. Asbestosis	Yes	No
b. Asthma	Yes	No
c. Chronic bronchitis	Yes	No
d. Emphysema	Yes	No
e. Pneumonia	Yes	No
f. Tuberculosis	Yes	No
g. Silicosis	Yes	No
h. Pneumothorax (collapsed lung)	Yes	No
i. Lung cancer	Yes	No
j. Broken ribs	Yes	No
k. Any chest injuries or surgeries	Yes	No
l. Any other lung problems that you’ve been told about	Yes	No
4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?
 

a. Shortness of breath	Yes	No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline	Yes	No
c. Shortness of breath when walking with other people at an ordinary pace on level ground	Yes	No
d. Have to stop for breath when walking		

- |  |   |     |    |
|--|---|-----|----|
|  | at your own pace on level ground  | Yes | No |
| e.   | Shortness of breath when washing or dressing yourself                             | Yes | No |
| f.   | Shortness of breath that interferes with your job                                 | Yes | No |
| g.   | Coughing that produces phlegm (thick sputum)                                      | Yes | No |
| h.   | Coughing that wakes you early in the morning                                      | Yes | No |
| i.   | Coughing that occurs mostly when you are lying down                               | Yes | No |
| j.   | Coughing up blood in the last month   | Yes | No |
| k.   | Wheezing  | Yes | No |
| l.   | Wheezing that interferes with your job  | Yes | No |
| m.   | Chest pain when you breathe deeply  | Yes | No |
| n.   | Any other symptoms that you think may be related to lung problems                 | Yes | No |
| 5. Have you <i>ever</i> had any of the following cardiovascular or heart problems? |   |     |    |
| a.   | Heart attack  | Yes | No |
| b.   | Stroke  | Yes | No |
| c.   | Angina  | Yes | No |
| d.   | Heart failure   | Yes | No |
| e.   | Swelling in your legs or feet (not caused by walking)                             | Yes | No |
| f.   | Heart arrhythmia (heart beating irregularly)                                      | Yes | No |
| g.   | High blood pressure   | Yes | No |
| h.   | Any other heart problem that you've been told about                               | Yes | No |
| 6. Have you <i>ever</i> had any of the following cardiovascular or heart symptoms: |   |     |    |
| a.   | Frequent pain or tightness in your chest  | Yes | No |
| b.   | Pain or tightness in your chest during physical activity...                       | Yes | No |
| c.   | Pain or tightness in your chest that interferes with your job                     | Yes | No |
| d.   | In the past two years, have you noticed your heart skipping or missing a beat     | Yes | No |
| e.   | Heartburn or indigestion that is not related to eating                            | Yes | No |
| f.   | Any other symptoms that you think may be related to heart or circulation problems | Yes | No |
| 7. Do you <i>currently</i> take medications for any of the following problems?     |   |     |    |
| a.   | Breathing or lung problems  | Yes | No |
| b.   | Heart trouble   | Yes | No |

- |                    |     |    |
|--------------------|-----|----|
| c. Blood pressure  | Yes | No |
| d. Seizures (fits) | Yes | No |

8. If you've used a respirator, have you *ever* had any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)

- |  |     |    |
|--|-----|----|
| a. Eye irritation  | Yes | No |
| b. Skin allergies or rashes  | Yes | No |
| c. Anxiety   | Yes | No |
| d. General weakness or fatigue                                     | Yes | No |
| e. Any other problem that interferes with your use of a respirator | Yes | No |

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire?

- |     |    |
|-----|----|
| Yes | No |
|-----|----|

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-face piece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you *ever* lost vision in either eye (temporarily or permanently):

- |     |    |
|-----|----|
| Yes | No |
|-----|----|

11. Do you *currently* have any of the following vision problems?

- |                                    |     |    |
|------------------------------------|-----|----|
| a. Wear contact lenses             | Yes | No |
| b. Wear glasses                    | Yes | No |
| c. Color blind                     | Yes | No |
| d. Any other eye or vision problem | Yes | No |

12. Have you *ever* had an injury to your ears, including a broken eardrum?

- |     |    |
|-----|----|
| Yes | No |
|-----|----|

13. Do you *currently* have any of the following hearing problems?

- |                                     |     |    |
|-------------------------------------|-----|----|
| a. Difficulty hearing               | Yes | No |
| b. Wear a hearing aid               | Yes | No |
| c. Any other hearing or ear problem | Yes | No |

14. Have you *ever* had a back injury

- |     |    |
|-----|----|
| Yes | No |
|-----|----|

15. Do you currently have any of the following musculoskeletal problems?

- |   |     |    |
|---|-----|----|
| a. Weakness in any of your arms, hands, legs, or feet               | Yes | No |
| b. Back pain  | Yes | No |
| c. Difficulty fully moving your arms and legs                       | Yes | No |
| d. Pain or stiffness when you lean forward or backward at the waist | Yes | No |
| e. Difficulty fully moving your head up or down                     | Yes | No |

- |    |  |     |    |
|----|--|-----|----|
| f. | Difficulty fully moving your head side to side                               | Yes | No |
| g. | Difficulty bending at your knees   | Yes | No |
| h. | Difficulty squatting to the ground   | Yes | No |
| i. | Climbing a flight of stairs or a ladder carrying more than 25 lbs.           | Yes | No |
| j. | Any other muscle or skeletal problem that interferes with using a respirator | Yes | No |

**Part B. Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.**

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g. gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes No

If "yes," name the chemicals if you know them: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

- |    |  |     |    |
|----|--|-----|----|
| a. | Asbestos   | Yes | No |
| b. | Hazardous dust (e.g. in sandblasting)...                 | Yes | No |
| c. | Tungsten/cobalt (e.g. grinding or welding this material) | Yes | No |
| d. | Beryllium  | Yes | No |
| e. | Aluminum   | Yes | No |
| f. | Coal (for example, mining)                               | Yes | No |
| g. | Iron   | Yes | No |
| h. | Tin  | Yes | No |
| i. | Dusty environments                                       | Yes | No |
| j. | Any other hazardous exposures                            | Yes | No |

If "yes," describe these exposures: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

4. List any second jobs or side businesses you have: \_\_\_\_\_

5. List your previous occupations: \_\_\_\_\_

6. List your current and previous hobbies: \_\_\_\_\_

7. Have you been in the military services? Yes No

If "yes," were you exposed to biological or chemical agents (either in training or combat):  
Yes No

8. Have you ever worked on a Hazardous Materials (HAZMAT) team? Yes No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes No

If "yes," name the medications if you know them:

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

10. Will you be using any of the following items with your respirator(s)?

a. High Efficiency Particulate Air (HEPA) Filters Yes No

b. Canisters (for example, gas masks) Yes No

c. Cartridges Yes No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you):

a. Escape only (no rescue) Yes No

b. Emergency rescue only Yes No

c. Less than 5 hours *per week* Yes No

d. Less than 2 hours *per day* Yes No

e. 2 to 4 hours *per day* Yes No

f. Over 4 hours *per day* Yes No

12. During the period you are using the respirator(s), is your work effort:

a. *Light* (less than 200 kcal per hour) Yes No

If "yes," how long does this period last during the average shift:

\_\_\_\_\_ Hrs. \_\_\_\_\_ Mins.

Examples of a light work effort are *sitting* while writing, typing, drafting, or performing light assembly work; or *standing* while operating a drill press (1-3 lbs.) or controlling machines.



b. *Moderate* (200 to 350 kcal per hour) Yes No

If "yes," how long does this period last during the average shift?:

\_\_\_\_\_ Hrs. \_\_\_\_\_ Mins.

Examples of moderate work effort are *sitting* while nailing for filing; *driving* a truck or bus in urban traffic; *standing* while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; *walking* on a level surface about 2 mph or down a 5-degree grade about 3 mph; or *pushing* a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. *Heavy* (above 350 kcal per hour) Yes No

If "yes," how long does this period last during the average shift:

\_\_\_\_\_ Hrs. \_\_\_\_\_ Mins.

Examples of heavy work are *lifting* a heavy load (about 50 lbs.) from the floor to your waist or shoulder; *working* on a loading dock; *shoveling*; *standing* while bricklaying or chipping castings; *walking* up an 8-degree grade about 2 mph; *climbing* stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you are using your respirator? Yes No

If "yes," describe this protective clothing and/or equipment: \_\_\_\_\_

\_\_\_\_\_

14. Will you be working under hot conditions (temperatures exceeding 77 degrees F)? Yes No

15. Will you be working under humid conditions: Yes No

16. Describe the work you will be doing while you are using your respirator: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

17. Describe any special or hazardous conditions you might encounter when you are using your respirator(s) (for example, confined spaces, life-threatening gases): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

18. Provide the following information, if you know it, for each toxic substance that you will be exposed to when you are using your respirator(s):

Name of the first toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

Name of the second toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

Name of the third toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

The name of any other toxic substances that you will be exposed to while using your respirator:

19. Describe any special responsibilities you will have while using your respirator(s) that may affect the safety and well-being of others (for example; rescue, security):







**ATTACHMENT C**

**PHYSICIAN'S RECOMMENDATION CONCERNING RESPIRATOR USE**

Physician's Name: \_\_\_\_\_

Employee's Name: \_\_\_\_\_ SS# \_\_\_\_\_

A medical evaluation or medical examination has been performed for the employee whose name appears on this form.

\_\_\_\_\_ This employee IS medically able to use a respirator

\_\_\_\_\_ This employee IS NOT medically able to use a respirator.

Limitations related to employee's medical condition: \_\_\_\_\_

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

Limitations related to employee's workplace condition: \_\_\_\_\_

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

\_\_\_\_\_ A follow-up medical evaluation is recommended.

\_\_\_\_\_ A follow-up medical evaluation is not necessary at this time.

I have provided a copy of this written Recommendation to the employee.

Physicians Signature \_\_\_\_\_

Date \_\_\_\_\_

Employee's Signature \_\_\_\_\_

Date \_\_\_\_\_

**ATTACHMENT D**  
**RESPIRATOR FIT TESTING (QUANTITATIVE)**

NAME	I.D. NO.	SOCIAL SECURITY NO	DATE
PROJECT NAME	PROJECT NO.	PROJECT LOCATION	
RESPIRATORS POTENTIALLY REQUIRED ON JOB?	YES	NO	COMMENTS
Half Face Cartridge			
Half Face Dust			
Half Face Fume			
Full Face Cartridge			
Full Face Canister			
Full Face SCBA (airpak)			
Quarter Face			
SENSITIVITY TEST: SACCHARIN (SA)	PASSED	FAILED	COMMENTS
<b>RESPIRATORS WHICH FIT</b>			
BRAND	FACEPIECE SIZE	TEST AGENT AMOUNT	COMMENTS
<b>RESPIRATORS WHICH DID NOT FIT</b>			
BRAND	FACEPIECE SIZE	TEST AGENT AMOUNT	COMMENTS
SIGNATURE OF TEST ADMINISTRATOR			DATE





**ATTACHMENT E**

**RESPIRATOR INSPECTION, MAINTENANCE AND REPAIR**

PROJECT NAME		PROJECT NUMBER			MONTH		
INSPECTOR'S NAMES(S)							
STATION NAME OR NUMBER	INSPECTED AND BACK IN SERVICE	DEFECTIVE RESPIRATOR OUT OF SERVICE	SPARE RESPIRATOR IN SERVICE	STATION PROBLEM UNRELATED IDENTITY	COMMENTS/ REPAIRS MADE	DATE OF INSPECTION	INITIALS OF INSPECTOR

**ATTACHMENT F**

**APPENDIX D - EMPLOYEE “VOLUNTARY RESPIRATOR USE” ACKNOWLEDGEMENT**

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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

**Information and Acknowledgement Form for Employees using Respirators When Not Required Under the OSHA Standard  
Sec. 1910.134 (Based on Appendix D of the Standard)**

You have indicated that you wish to voluntarily wear a respiratory protection device. The following information is required by OSHA to be supplied to employees who wish to use respiratory protection devices voluntarily. Please read this information and sign the form to indicate that you have received this information:

OSHA Standard 1910.134 Appendix D:

“Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard. You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.”

- Voluntary respirator use is permitted in non-hazardous atmospheres only. -

I acknowledge that I have read the HART Engineering Project's Respiratory Protection Program, including the section on Voluntary (Comfort) Respirator Use, and have received a copy of the information for voluntary use of respirators when not required under the Standard Sec. 1910.134. I have discussed these documents with my supervisor, have received medical clearance to wear a respirator, and am in compliance with the requirements of the HART Companies' Respiratory Protection Program. I will receive a signed copy of this document from my supervisor for my records.

Employee Name: \_\_\_\_\_

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

Supervisor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

This document must be kept on file in the user's department respiratory protection records.



# **BLOODBORNE PATHOGENS**

**BLOODBORNE PATHOGEN PROGRAM**

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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

## Purpose

The purpose of this section is to develop and implement an effective Bloodborne Pathogens Program/Policy. An infection control plan must be prepared for all persons who handle, store, use, process, or dispose of infectious medical wastes – or may come into contact with these and related hazard exposures during the course of their work. This infection control plan complies with OSHA requirement, 29 CFR 1910.1030, Blood Borne Pathogens. The plan includes requirements for personal protective equipment, housekeeping, training, and a procedure for reporting exposures.

## Responsibilities

- The HART Project's On-Site Safety Representative or Designated Safety Competent Person will conduct the Bloodborne Pathogen Program and maintain records of on-site training and inspections for this program.
- HART Project Management will ensure proper conduct of the program through inspections, record keeping and may include periodic audit.

## Definitions

**Biological Hazard.** The term biological hazard or biohazard is taken to mean any viable infectious agent that presents a risk, or a potential risk, to the well being of humans.

**Medical Wastes/Infectious Wastes.** All waste emanating from human or animal tissues, blood or blood products or fluids. This includes used first aid bandages, syringes, needles, sharps, material used in spill cleanup and contaminated PPE or clothing.

**Universal Precautions.** Refers to a system of infectious disease control that assumes that every direct contact with body fluids is infectious and requires every employee exposed to be protected as though such body fluids were infected with blood-borne pathogens. All infectious/medical material must be handled according to Universal Precautions (OSHA Instruction CPL 2-2.44A)

## Hazards

Unprotected exposure to body fluids presents the possible risk of infection from a number of bloodborne pathogens notably Hepatitis and HIV.

## Hazard Control

**Engineering Controls** - prevention of exposure to bloodborne pathogens engineering controls include



proper storage facilities and containers, syringes designed to prevent accidental needle sticks, autoclaves and disinfectant equipment.

Engineering and work practice controls shall be a primary line of defense to reduce and/or minimize employee exposure such as:

1. Accessible hand washing facilities
2. Minimize splashing or splattering of blood.
3. Proper handling of sharp objects and contaminated wastes.
4. Proper utilization of PPE
5. No eating, drinking, smoking, applying cosmetics, or handling contact lenses in areas where occupational exposure is likely.
6. Contaminated equipment must be decontaminated before servicing or placing back into service.

**Administrative Controls** - prevention of exposure to bloodborne pathogen administrative controls include universal precautions, procedural controls, employee training, use of spill kits specifically designed for blood and body fluids, restricted access to waste collection points and waste disposal procedures.

**Personal Protective Equipment** – items that must be used and/or worn to protect the employee from direct exposure to bloodborne pathogens (blood, body fluids and other potentially infectious materials). Personal Protective Equipment, when properly worn and used, serves to protect the employee while in close and/or direct contact to the exposure/hazard. The use of Personal Protective Equipment merely serves as a protective measure, and does nothing to remove or reduce the significant hazard to any degree.

Personal protective equipment (PPE) is required not only to protect the skin and mucous membranes from contact with infectious materials but also to prevent contamination of street and work clothing.

Personal protective equipment will be provided, made accessible, cleaned, laundered, and repaired or replaced as needed, all at no cost to the worker. Examples of personal protective equipment include gloves, gowns, laboratory coats, face shields, masks, eye protection, mouthpieces, and resuscitation bags.

Workers must use appropriate PPE and must remove PPE before leaving the work area. PPE must be placed in the appropriate location for storage or disposal.

Washing of contaminated PPE or contaminated personal clothing at home is not permitted. Workers whose personal clothing becomes contaminated will be required to change at the work site. The worker either may have a change of clothes stored at the work location or will be issued some clothing (such as cotton coveralls) until the contaminated ones are cleaned or replaced.

PPE shall be used in accordance with the level of exposure encountered. Minor lacerations or small amounts of blood do not merit the same extent of barrier use as with massive bleeding. (For example: Mask and eye wear such as goggles and safety glasses shall be worn by all personnel in any situation where splashes of blood or other body fluids are likely to occur. Gowns or aprons shall be worn to protect clothing if large splashes are anticipated).

People administering first aid and/or CPR shall be responsible for cleanup and proper disposal of bio-hazardous waste accumulated during medical emergencies. Non-disposable equipment shall be cleaned and disinfected before placing back into service. Instruments (scissors, tweezers, etc.) should be cleaned with alcohol or approved disinfectants. Janitorial personnel coming into contact with infectious waste

shall contact the employee on site responsible for safety.

### **Reporting and Record Keeping**

Any reports required by OSHA will be maintained by the Occupational Health Department. All reports (Training Certificates, Notice of HBV Vaccinations, exposure reports) will be maintained for 30 years. Occupationally contracted HBV or HIV will be recorded on the OSHA 300 Log of Occupational Injuries and Illnesses as an illness. Exposures to blood-borne pathogens from contact with sharps will be recorded on the OSHA 300 Log of Occupational Injuries and Illnesses if treatment such as gamma globulin, hepatitis B immune globulin or hepatitis B vaccine is prescribed by a Physician.

### **Training**

All personnel assigned duties as First Aid/CPR-AED First Responders and Custodial Employees (those that clean rest rooms, etc.) will receive initial and annual training by a qualified medical practitioner on the Bloodborne Pathogen Program. Additionally, personnel later trained in First Aid/CPR-AED use shall be offered this annual training.

All new and current affected Employees will be trained initially and annually thereafter. The content of the training program will include:

1. Company Policy
2. Types and transmission of Blood-Borne Pathogens
3. General Safety Rules
4. Universal Precautions
5. Use of Personal Protective Equipment
6. Medical Waste Disposal Procedures
7. Post Exposure Treatment and Procedures
8. HBV Vaccinations

Documentation of training will be by *Control of Blood-Borne Pathogens Training Certificate*

All Employees not affected by this Program will receive an overview of the program requirements during scheduled department Safety Meetings with documentation by Safety Meeting Minutes Form.

### **Hepatitis-B Virus (HBV) Vaccinations**

Occupational Health Professionals and those required to provide first aid or emergency response duties or medical care on a routine basis will be offered Hepatitis-B Virus (HBV) Vaccinations at Company expense. Employees that transfer to a job or their job is reclassified to include exposure to blood-borne pathogens will be offered HBV Vaccinations within 10 working days of the transfer or reclassification.

The choice for HBV vaccination is not mandatory. If an affected Employee chooses not to have the vaccination at the initial offering, they will have the opportunity to be vaccinated when they are ready. The Company will document the offer, acceptance or declination, and vaccination dates with the *Notice of HBV Vaccinations Form*.

### **Post Exposure Treatment and Notification Procedures**

Should an affected Employee or an Employee acting as a "Good Samaritan" be occupationally exposed to HIV/HAV/HBV, the following procedure is to be followed:

1. The affected Employee will report the exposure to their supervisor and the Company Safety Director.
2. The Company will provide for the Employee to be tested for HIV/HAV/HBV at Company expense.
  - a. Following the initial blood test at time of exposure, seronegative Employees will be retested at 6 weeks, 12 weeks and 6 months to determine if transmission has occurred.
  - b. During this period, the Employee will follow the recommendations provided by the Attending Physician or Medical Professional.
3. An "occupational exposure" is defined as blood or body fluid contact from an injured or ill Employee to the affected Employee or injury by a contaminated sharp object.
4. Following the report of exposure, Human Resources will contact the exposure source and request that person be tested for HIV/HAV/HBV at Company expense. The request is not mandatory and if refused will not effect that Employee's future employment.
5. The source individual's blood is tested as soon as possible and after consent is obtained to determine HBV and HIV infectivity. (Hepatitis B surface Antigen, Hepatitis C Antibody and HIV Screen)
6. The exposed employee's blood shall be collected as soon as feasible and tested for HBV (Hepatitis Bs Antibody, Hepatitis C Antibody) and HIV serological status after consent is obtained (Employee Consent for HIV Antibody Testing).
7. During all phases of Post Exposure, the confidentiality of the affected Employee and exposure source will be maintained on a "need to know basis".
  - a. The *Blood-Borne Pathogens Exposure and Treatment* form is used to document the exposure and offer of medical assistance to the affected Employee and use the *Medical Consent for Blood-Borne Pathogens Testing* form for the exposure source.
  - b. The results of any HIV/HAV/HBV tests conducted will be provided to the exposed and source Employees within 5 business days of receipt.

## **General Procedures**

The following procedures must be followed by personnel when in the HART Companies Corporate Office Building, the Manufacturing Shop/Warehouse and Construction Projects.

1. All supervisors must ensure that their staff is trained in proper work practices, the concept of universal precautions, personal protective equipment, and in proper cleanup and disposal techniques.

2. Resuscitation equipment, pocket masks, resuscitation bags, or other ventilation equipment must be provided to eliminate the need for direct mouth to mouth contact in groups where resuscitation is a part of their responsibilities.
3. Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a potential for exposure to any health hazard. Food and drink must not be stored in refrigerators, freezers, or cabinets where blood or other potentially infectious material is stored or in other areas of possible contamination.
4. According to the level of risk, wearing laboratory or protective clothing may be required for persons entering infectious disease laboratories. Likewise, showers with a germicidal soap may be required before exit.
5. Gowns, aprons, or lab coats must be worn whenever there is a possibility that body fluids could splash on skin or clothing.
6. Gloves must be made of appropriate disposable material, usually intact latex or vinyl. They must be used in the following circumstances:
  - a. When the employee has cuts, abraded skin, chapped hands, dermatitis, or similar conditions.
  - b. When examining abraded or non-intact skin of a patient with active bleeding.
  - c. While handling blood or blood products or other body secretions during routine laboratory procedures.
7. Employees must wash their hands immediately, or as soon as possible, after removal of gloves or other personal protective equipment and after hand contact with blood or other potentially infectious materials.
8. All personal protective equipment must be removed immediately upon leaving the work area, and if this equipment is overtly contaminated, it must be placed in an appropriate area or container for storage, washing, decontamination, or disposal.
9. Contaminated clothing must not be worn in clean areas or outside the building.
10. All procedures involving blood or other potentially infectious agents must be performed in a manner that will minimize splashing, spraying, and aerosolization.

## **Medical Wastes**

Medical/infectious waste must be segregated from other waste at the point of origin.

1. Medical/infectious waste, except for 'sharps' (i.e., razor blades, broken glass, needles, etc.) capable of puncturing or cutting, must be contained in double disposable red bags conspicuously labeled with the words "INFECTIOUS WASTE" and "BIOHAZARD."

2. Used needles or other sharps (razor blades, broken glass, scalpels, etc.) must not be sheared, bent, broken, recapped, or resheathed.
3. Infectious sharps must be contained for disposal in leak-proof, rigid puncture-resistant containers. Infectious waste contained as described above must be placed in reusable or disposable leak-proof bins or barrels that are conspicuously labeled with the words "INFECTIOUS WASTE" and "BIOHAZARD." These waste barrels are picked up regularly by an outside company licensed to handle infectious wastes.
4. All infectious agents, equipment, or apparatus must be disinfected in an autoclave or otherwise disinfected before being washed or disposed of. Each individual working with infectious bio-hazardous agents is responsible for dis-infection and disposal of these agents.
5. Biological wastes that do not contain radioactive or hazardous substances may be disinfected by steam sterilization (autoclave) then disposed of in the regular trash.
6. Liquid bio-hazardous waste may be disposed of in the sewage system following chemical decontamination.
7. Reusable items (exposed tools) must be decontaminated in sodium hypo chlorite (household bleach) solution (1:9) prior to rinsing and acid washing. The glassware must then be sterilized in an autoclave.
8. To minimize the hazard to firefighters or emergency response personnel, at the close of each work day and before the building is closed, all infectious or toxic material must be placed in a refrigerator, placed in an incubator, or autoclaved or otherwise disinfected.
9. Infectious agents must not be placed in an autoclave and left overnight in anticipation of autoclaving the next day.
10. Floors, work surfaces, laboratory benches, and other surfaces in buildings that have come into contact with bloodborne pathogens and/or infectious agents must be disinfected with a suitable germicide, such as 1:9 sodium hypo chlorite solution (household bleach) as often as necessary as determined by the supervisor.
11. The surroundings must be disinfected after completion of operations involving bloodborne pathogens. Similar procedures are require following incidents with infectious agents.
12. Infectious agents must not be dumped into the building drainage system without prior disinfection.

### **Cuts**

If an employee has a needle stick, cut, or mucous membrane exposure to another person's body fluids he/she must report the incident immediately to their supervisor and the Corporate Safety Office.

### **Blood Exposure**

All employees exposed to human blood and blood products must report to the Corporate Safety Director for information and possible inclusion in the Hepatitis B Immunization Program.

### **Infection Control Plan**

The purpose of the Infection Control Plan is to protect the health and safety of the persons directly involved in handling the materials, Company personnel and the general public by ensuring the safe handling, storage, use, processing, and disposal of infectious medical waste. This plan complies with OSHA requirement proposed for 29 CFR 1910.1030, Bloodborne Pathogens.

### **Universal precautions**

Refers to a system of infectious disease control which assumes that every direct contact with body fluids is infectious and requires every employee exposed to be protected as though such body fluids were infected with blood-borne pathogens. All infectious/medical material must be handled according to Universal Precautions (OSHA Instruction CPL 2-2.44A).

The following universal precautions must be taken:

1. Gloves must be made of appropriate disposable material, usually intact latex or vinyl. They must be used:
  - a. when the employee has cuts, abraded skin, chapped hands, dermatitis, or the like.
  - b. when examining abraded or non-intact skin of a patient with active bleeding.
  - c. while handling blood or blood products or other body secretions during routine procedures.
2. Gowns, aprons, or lab coats must be worn when splashes of body fluid on skin or clothing are possible.
3. Mask and eye protection are required when contact of mucosal membranes (eyes, mouth or nose) with body fluids is likely to occur (e.g. splashes or aerosolization).
4. Resuscitation equipment, pocket masks, resuscitation bags, or other ventilation equipment must be provided to eliminate the need for direct mouth to mouth contact.

### **Waste Disposal Plan**

1. Medical/Infectious waste must be segregated from other waste at the point of origin.
2. Medical/Infectious waste, except for sharps (e.g. razor blades, broken glass, needles, etc.) capable of puncturing or cutting must be contained in double disposable red bags conspicuously labeled with the words, "INFECTIOUS WASTE -- BIOHAZARD."
3. Infectious sharps must be contained for disposal in leak-proof, rigid puncture resistant containers.

4. Infectious waste thus contained as described as items 2 and 3 above must be placed in reusable or disposable leak-proof bins or barrels which must be conspicuously labeled with the words, "INFECTIOUS WASTE -- BIOHAZARD." These waste barrels will be picked up by an outside company licensed to handle infectious wastes.
5. Spills/Disinfectants: Spills and contaminated walking/work surfaces, must be cleaned using the following:
  - a. Spills must be cleaned up immediately.
  - b. Initial (gross) cleanup of a spill with a chemical germicide approved as a 'hospital disinfectant.'
  - c. The area is then cleaned with a 10% solution of sodium hypo chlorite (household bleach) diluted with water to disinfect.
    - i. The bleach solution must be allowed to 'stand and soak' for 10 minutes to effectively disinfect the contaminated area.
6. After removing gloves, and/or after contact with body fluids, hands and other skin surfaces must be washed thoroughly and immediately with soap or other disinfectant in hot water.
7. Liquid biohazard waste may be disposed of in the sewage system following chemical decontamination.
8. Reusable equipment or other non-disposable items must be decontaminated in sodium hyper chlorite (household bleach) solution (1:9) prior to rinsing and acid washing. Certain exposures may require that the items be subject to further/more advanced means of sterilization (i.e., in an autoclave)



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## **Personal Protective Equipment for Worker Protection Against HIV and HBV Transmission**

**For Posting**

<b>TASK</b>	<b>GLOVES</b>	<b>APRON</b>	<b>MASK</b>	<b>EYEWEAR</b>
Control of Bleeding w/ spurting blood	X	X	X	X
Bleeding control with minimal bleeding	X			
Emergency Child Birth	X	X	X	X

Handling & Cleaning Instruments	X			
Cleaning Bio Spills	X			
Taking Temperature				
Giving Injection	X			
Measuring Blood Pressure				
OTHER (Site Specific)				

The examples provided in this table are based on application of universal precautions. Universal precautions are intended to supplement rather than replace recommendation for routine infection control, such as hand washing and using gloves to prevent gross microbial contamination of hands (e.g., contact with urine or feces).

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# **Blood-Borne Pathogen Control Universal Precautions and General Safety Rules**

## **For Posting**

**Exposure Determination:** HART Companies and its Divisions and Subsidiaries will not perform invasive medical treatment or provide intravenous medication. Therefore, the exposure to Blood-Borne Pathogens, as defined in item # 3 below, is determined to be from routine and emergency first aid treatment of common workplace injuries. The following Universal Precautions and General Safety Rules have been established to prevent the spread of viral and bacterial organisms (namely HIV/HAV/HBV). In all cases, the Universal Precautions and General Safety Rules should be followed.

1. Before and immediately after providing patient care, wash exposed areas (hands, arms, etc.) with antibacterial soap.

2. Don and use the required personal protective equipment for the medical care given as outlined in the Personal Protective Equipment for Worker Protection Poster.
3. Treat all human body fluids and items soiled with human body fluids (blood, blood products, semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, concentrated HIV/HAV/HBV, and saliva (in dental settings) as if contaminated with HIV/HAV/HBV.  
**Note:** Feces, urine, nasal secretions, sputum, sweat, tears, or vomitus need not be treated as contaminated unless they contain visible blood
4. No smoking, eating, drinking or storage of food products are permitted in patient treatment areas. Non-medical items, such as clothing and personal effects, should not be stored in the treatment facility.
5. Patient treatment areas, when applicable, will be maintained in a near sanitary condition at all times. Daily and at least once per shift, the Occupational Health Facility will be disinfected with antibacterial/viral solution (at least 10% Chlorine Bleach or equivalent). All medical and personal protective equipment contaminated with human body fluids will be disinfected before being returned for use again.
6. To avoid special handling, all clothing contaminated with human body fluid will be presoaked (sprayed on the affected areas) with the antibacterial/viral solution before being sent to the laundry.  
**Note:** Gloves and eye protection must be worn when handling contaminated clothing until presoaked for 10 minutes)
7. Any spills of body fluid will be presoaked (sprayed on the affected area) with antibacterial/viral solution and remain soaking for 10 minutes before being removed.  
**Note:** Gloves and eye protection must be worn when handling spills of body fluids.
8. Medical Wastes (those soiled with covered human body fluids) will be treated following the Medical Wastes Treatment and Disposal Procedures before being discarded as ordinary wastes.
9. Any suspected exposure to HIV/HAV/HBV by human body fluid contact (via broken skin, human bites, needle sticks, etc.) should be reported to your Supervisor immediately.

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## **Control of Blood-Borne Pathogens Program Medical Waste Treatment and Disposal Procedures**

### **For Posting**

1. All Medical Wastes (those soiled with covered human body fluids) will be placed in a red leak-proof container marked either *Biohazard* or *Medical Waste*. All other wastes will be discarded following customary procedures. (**Note:** Soiled feminine hygiene/sanitary napkins, soiled facial tissues, etc. are not considered a biohazard or medical waste. Pretreatment is not necessary; however, Employees should wear personal protective equipment and wash hands with antibacterial soap afterwards)
2. Don and use the required personal protective equipment when handling medical wastes as outlined in the *Personal Protective Equipment for Worker Protection* Poster.

3. At the end of each shift, any and all accumulated medical wastes will be treated to remove biohazards using the following procedure:
  - Prepare a solution of 10 percent chlorine bleach to water (approximately 2 cups chlorine bleach to 1 gallon of water)
  - Pour solution over the medical wastes and thoroughly saturate
  - Let stand for 10 minutes and then drain into sink
  - Discard as ordinary wastes

**CAUTION:**

Sharp objects (broken glass, hypodermic needles, etc.) should not be handled by hand to prevent accidental punctures and lacerations

4. Triple Rinse medical wastes container and return for use again.
5. Triple Wash hands and exposed areas with antibacterial soap.

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**JOB CLASSIFICATIONS IN WHICH ALL EMPLOYEES HAVE  
EXPOSURE TO BLOODBORNE PATHOGENS**

**APPENDIX A**

Below are listed the job classifications in each Company's facility where all workers may come into contact with human blood or other potentially infectious materials which may result in possible exposure to bloodborne pathogens:

<b>JOB TITLE</b>	<b>DEPARTMENT AND/OR LOCATION</b>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____




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**JOB CLASSIFICATIONS IN WHICH SOME EMPLOYEES HAVE  
EXPOSURE TO BLOODBORNE PATHOGENS**

**APPENDIX B**

Below are listed the job classifications in each Company's facility where some workers may come into contact with human blood or other potentially infectious materials which may result in possible exposure to bloodborne pathogens:

<b>JOB TITLE</b>	<b>DEPARTMENT AND/OR LOCATION</b>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

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## SHARPS INJURY LOG

### Appendix C

Date Entered	Date & Time of Incident	Type & Brand of Device	Department or Work Area Where Incident Occurred	Description of Incident


Retain Until \_\_\_\_\_ (five years after end of log year)



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## PERSONAL PROTECTIVE EQUIPMENT/TASK LIST

### Appendix D

Job Classification	Task/Procedure	Type of PPE to be Used	PPE to be Issued By



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## CLEANING AND DECONTAMINATION SCHEDULE

### Appendix E

The following schedule describes work areas at that should be decontaminated, decontamination frequency and method, and required types of cleaning.

*Information concerning usage of protective coverings used to help keep surfaces free of contamination (such as plastic wrap) should be included.*

Work Area/Equipment	Cleaning and Decontamination Frequency	Type of Cleaners or Supplies to be Used	Method of Cleaning to be Used	Responsible Person





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## HEPATITIS B VACCINE DECLINATION

### Appendix F

I understand that, due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring the Hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine, at no charge to me. However, I decline the Hepatitis B vaccination at this time.

I understand that by declining this vaccine, I continue to be at risk of acquiring the serious disease Hepatitis B.

If, in the future, I continue to experience occupational exposure to blood or other potentially infectious materials and I wish to be vaccinated with the Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

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*Employee Name, Printed*

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*Employee Signature*

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*Date*

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*Project Manager Name, Printed*

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*Project Manager Signature*

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*Date*

## **SECTION 2**

# **CONTRACTOR RESPONSIBILITIES FOR SAFETY**

The Safety and Health Rules and Regulations contained herein are not all inclusive. All OSHA,

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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

HART Companies Corporate Safety Manual requirements, and any and all other recognized and/or referenced standards not specifically identified in this set of project regulations shall govern as applicable.

## **CHANGES ARE NOT TO BE MADE TO THIS DOCUMENT WITHOUT PRIOR APPROVAL OF THE HART SAFETY DEPARTMENT**

HART Engineering Corporation's management team is dedicated, at all levels, to ensure that all employees, subcontractors, project support activities, and visitors are provided a safe and healthy environment in which to work.

This safety program has been prepared to assist each employer with personnel on-site in satisfying its contractual and legal accident prevention responsibilities, in such a manner that a safe, efficient operation is assured. Subcontractor and support activities employers (such as vendors, or delivery and other services) should consult with its safety organization, insurance carrier or similar resource.

The contents of this program is not to be considered as an all-inclusive reference to all hazards that might be encountered, safe practices that should be performed, or safe conditions that should be maintained during the course of this project's work.

### **1.0 HART SUB-TIER PARTNER RESPONSIBILITIES**

#### **Safety Specialist**

Frequent and regular documented inspections of the jobsite shall be made by a competent safety representative designated by each HART Sub-tier Partner, with reports submitted to the on-site Hart Project Team Office. Unsafe acts and/or conditions noted during inspections shall be corrected immediately. The HART Sub-tier Partner shall provide one full-time dedicated competent Safety Specialist whenever the HART Sub-tier Partner meets or exceeds 20 employees. Additional full-time competent Safety Specialists will be assigned to the Project for each increase of 200 employees. Additional competent Safety personnel may be required due to geographic location, specific hazards, client requirements, local regulatory requirements or other conditions that may be revealed during the course of the work. All such safety representatives who, because of their documented training and experience, shall be capable of identifying existing or potential hazards in the job(s) being performed, identifying working conditions that are unsanitary, hazardous, or dangerous to the safety and health of employees, shall have the authority to take immediate corrective action to remove the exposure of employees to known and identified hazards.

The name and credentials of the HART Sub-tier Partner's Safety Specialist that will be assigned to the project shall be submitted to the HART Corporate Safety Director for review and approval prior to HART Sub-tier Partner's mobilization at the Project site.

The HART Sub-tier Partner will be required to provide a 'Competent Person' to implement the contract Safety Rules and Regulations in accordance with Federal, State, HART Project Manager and Owner requirements when the combined workforce of the HART Sub-tier Partner and its Sub tiers is below 20.

#### **Employee Hazard Awareness**

The HART Sub-tier Partner shall recognize that it and its Sub-tier Bidders, suppliers and employees have the obligation to comply with all Federal and/or State Safety and Health laws and regulations, in addition to all HART project-specific requirements.

By accepting the award of work, the HART Sub-tier Partner specifically acknowledges that it has primary responsibility to educate and train their employees in the recognition of workplace hazards. The HART Sub-tier Partner also must correct all Health and Safety hazards for which their respective employees and/or their related Sub-tier Bidders' employees are responsible. The HART Sub-tier Partner further acknowledges that it and its Sub-tier bidders, suppliers and employees have special expertise in recognition and prevention of such hazards in the operations for which they are responsible, and that the HART Project Team is relying upon such expertise by the HART Sub-tier Partner and its Sub-tier Bidders, suppliers and employees to maintain a safe worksite. The HART Project Manager and Corporate Safety Director retain the right to direct the HART Sub-tier Partner to eliminate all hazards of which the HART Project Manager has actual knowledge, but the recognition and abatement of such hazards are the responsibility of the HART Sub-tier Partner and its Sub-tier Bidders, suppliers and employees.

HART Sub-tier Partner shall instruct each employee on the jobsite in the recognition and avoidance of unsafe acts and/or conditions applicable to its work. HART Sub-tier Partner shall enforce all statutory and project safety rules.

#### **Personal Protective Equipment Responsibilities**

Each HART Sub-tier Partner is responsible for providing appropriate personal protective equipment to their employees and training them in the proper wearing, use and care of those items. When there is an exposure to any hazardous conditions specifically related to a particular scope of work or work process, the HART Sub-tier Partner shall provide technical expertise in training other project-related personnel in the basic recognition and prevention of these hazards. All Personal Protective Equipment records shall be maintained and made available to all project activities at a specific location designated by the HART Project Manager,.

#### **Hazard Communication/Chemical Safety Responsibilities**

HART Sub-tier Partner is responsible for notifying HART Project Manager of any hazardous chemicals or substances that are brought onto jobsite. HART Sub-tier Partner shall provide HART Project Manager with a copy of HART Sub-tier Partner's Site-Specific Hazard Communication Program and an inventory of and the associated Material Safety Data Sheet(s) (MSDS) for the chemical(s) or substance(s) intended for use on the site.

A bookcase, centrally located, will be dedicated as a repository for this information. HART Sub-tier Partner is responsible for keeping this information current and for maintaining a copy of HART Sub-tier Partner's Hazard Communication Program and Material Safety Data Sheet(s) on site for HART Sub-tier Partner's own reference and employee training. The legal storage, use and disposal of hazardous chemical waste are the responsibility of HART Sub-tier Partner. HART Sub-tier Partners shall make provisions for adequate spill control, containment and clean up equipment for chemicals brought on-site.

#### **General Safety Program Requirements**

OSHA standards will serve as the minimum safety requirements for the project. Any jobsite safety regulation, which exceeds the minimum standards established by OSHA, shall be incorporated in HART Sub-tier Partner's safety program.

## **2.0 PRE-CONSTRUCTION MEETING**

HART Sub-tier Partner shall attend a pre-construction meeting with HART Project Manager to facilitate an understanding of the project conditions and safety requirements before staffing work at the jobsite. A jobsite tour shall be made to confirm- HART Sub-tier Partner's awareness of potential safety hazards. Appropriate methods, equipment, devices and material shall be provided by HART Sub-tier Partner to assure a safe work place. It is HART Sub-tier Partner's obligation to undertake any action that may be required to establish and maintain safe working conditions at the jobsite.

## **3.0 JHA - JOB HAZARD ANALYSIS**

Prior to the HART Sub-tier Partner commencing work on the HART Team's projects, the HART Sub-tier Partner and any Sub-tiers shall submit to the Project Manager's site management, a detailed Job Hazard Analysis for each definable feature of the work, identifying the Scope of Work, known hazards, and corrective abatement measures that will be implemented.

## **4.0 STA SAFETY TASK ASSIGNMENT**

HART Sub-tier Partner's supervisors (superintendents/foremen) are required to plan their work daily, and to review with its employees any known hazards and corrective actions to be taken to safeguard the work. This review shall utilize HART Project's STA; Safety Task Assignment. All employees and the Supervisor working in the area are required to review and to sign-off daily on the form posted in the work area, to complete the post-STA, and to return same to the HART Project Manager's Safety Department at the end of the shift. All Foremen are required to attend the HART Project Manager's STA Training.

## **5.0 INSTRUCTION AND TRAINING**

Employer training of employees is an OSHA requirement, and as such, will be required on this project. Examples of such required training to be provided by HART Sub-tier Partner are:

**Indoctrination/Orientation** - Newly employed, promoted and/or transferred personnel shall be verbally instructed in the safety practices required by their work assignments. HART Sub-tier Partners shall reserve 4 hours per person for HART's site-specific orientation, access/badging and project safety training initiatives.

**Work Assignments** - All work assignments must include specific attention to safety prior to commencement of the task. "Follow-up" monitoring is required in order to prevent accidents. (Safety Task Assignments/Job Safety Analysis)

**Meetings** - Regular and properly conducted craft toolbox safety meetings are required to be documented weekly. HART's program stipulates that Tool Box Talks shall be

conducted on the first workday of each week, with the signature sheets transmitted to the HART corporate office before the close of business that day. Additional project meetings with HART's Project Manager's regular site/operations meeting shall have the initial portion of the agenda devoted to accident/incident review and prevention.

**Specific Instructions** - OSHA requires that employees performing specific tasks or operating specific equipment be trained in its intended application, appropriate usage, limitations and preventative care.

## **6.0 RECORDKEEPING OF ACCIDENTS AND TRAINING**

HART Sub-tier Partner must maintain all records required by OSHA, Worker's Compensation, Insurance or similar regulations. This includes the maintenance of an accident log, completion of an annual summary and the posting of all prescribed posters. A log of safety activities, accident investigations, employee instruction, training, "tool box" meetings, etc., shall be maintained on jobsite and copies shall be promptly provided to HART Project Manager upon request. It is HART Engineering's policy that the subcontractors must report any and all accidents, injuries, incidents, and near misses to the HART Project Team Office.

## **7.0 SUBSTANCE ABUSE PREVENTION/RFQ/IFB & CONTRACT LANGUAGE**

The possession, use, manufacture, distribution, impairment or distribution of any illegal drugs or controlled substances, or the use of, or impairment by, alcohol is prohibited on the HART project's Host-Client's property. Additionally, the HART Sub-tier Partner's personnel are expected to report to work in proper condition and not under the influence of any intoxicating or controlled substance.

The HART Sub-tier Partner will agree to provide only personnel who understand and who shall abide by the requirements of this Article.

## **8.0 SAFETY INSPECTIONS**

HART Sub-tier Partners are required to conduct, and to document, Safety inspections at least weekly at a minimum. Frequency of the visits may be increased as the resource loading or activity of the project increases.

In addition to visits and safety inspections by HART and subcontractor trades corporate representatives, the HART Sub-tier Partners are advised that the project site may be inspected from time to time by any authorized third parties. Authorized third parties may include; representatives of HART Engineering Corporation, the Client, insurance agencies, risk management activities, construction/engineering peer organizations,

and regulatory organizations such as OSHA. Following the proper identification of such third party representatives, access for a specific purpose may be granted with an appropriate accompanying escort to ensure their safety while within the project site. HART Sub-tier Partners must correct any hazard created by their employees, or any that expose their employees to a developed risk, immediately upon its discovery by the HART Sub-tier Partner, HART Project Team, the Client, OSHA or Risk Management personnel.

## **9.0 CONSTRUCTION EMERGENCY ACTION PLAN & DRILLS**

The HART Project Manager will provide HART Sub-tier Partners with a Construction



Emergency Action Plan for evacuation of the worksite in the event of any project emergency or natural disaster. HART Sub-tier Partners will be responsible for advising their respective employees of the emergency signals, response protocols and primary evacuation route. The HART Sub-tier Partners are advised that periodic emergency evacuation drills may be mandated and scheduled by the Owner. Any lost time by the HART Sub-tier Partners are non-compensable, as they are understood to be a necessary part of the project's operation.

## **10.0 PROJECT SAFETY AND SECURITY RULES & GUIDELINES**

All personnel on this project, including the employees of HART Sub-tier Partners, will be required to comply with these established guidelines. The HART Sub-tier Partners shall ensure that all their employees have read and understand these guidelines. The employee must sign a declaration that shall then be retained by the HART Sub-tier Partners within the employee's personnel file. In addition the HART Sub-tier Partners shall comply with the following:

### **11.0 CLOTHING REQUIREMENTS**

- Shirts with a minimum four-inch sleeve shall be worn at all times. Sleeveless shirts and tank tops are not permitted.
- Long pants are required. Sweat pants/jogging pants are prohibited.
- Foot Protection in the form of sturdy leather work boots are required at all times, at all HART work locations. Sandals, tennis shoes, or any other street type shoe will not be permitted. Work boots must feature a substantive sole and rise to support the ankles. ANSI Compliant 'Safety Toe' footwear or 'Safety Shoes' are required for tasks/activities that have the potential to contribute or cause injuries to the foot.
- Loose fitting clothes or jewelry shall not be worn around moving machinery, or other operations that present rotating, sliding or reciprocating motions, etc.
- Hair that could come in contact with, or be caught in machinery or other hazard, shall be restrained and protected as appropriate.
- Contamination or cleanliness protocol may dictate the necessity to wear lab coats, coveralls, hairnets, etc.
- Life jackets will be worn, if working over water, in accordance with OSHA's requirements.

### **12.0 PERSONAL PROTECTIVE EQUIPMENT**

- Approved hard hats meeting specifications contained in American National Standards Institute (ANSI), Z89.1-1981 and/or Z89.2-1971, must be worn, bill forward, at all times in construction areas, lay-down yards, etc.
- Safety glasses meeting specifications of ANSI Z87.1+, with integral side shields are required at all times within any shop, plant and construction work area.
- Prescription safety eyeglasses must meet the requirements of ANSI Z87.1+, or suitable eye protection shall be worn over them.
- Approved eye and face protection is required as follows: Goggles, welding hoods and shields, and face shields will be required to be properly worn at all times when in the area of operations, such as when welding, burning, grinding,

chipping, chemical handling, corrosive liquids or molten materials, drilling, sawing, driving nails, power actuated tools, concrete pouring, tampers and gas fuelled hand operated equipment (i.e. chainsaws). This section will also apply to those employees of HART Sub-tier Partner who are assisting any worker as an apprentice or helper. Prescription glasses must be approved safety glasses or approved eye protection shall be worn.

- To prevent hand and finger injuries, hand protection is required for all construction work activities on the project site, including, but not limited to the following activities:
  - Handling sharp metal materials
  - Cutting with hand-held non-power cutters
  - Handling wood materials
  - Concrete operations
  - Pulling wire in electric panels
  - Rigging
  - Operating a grinder
  - Handling chemicals & paints
  - Handling glass
  - Handling hot or cold objects
  - Welding/cutting
- Hearing conservation and respiratory protective equipment shall be worn when required. Selection of protective equipment shall be appropriate to the anticipated hazards. Manufacturer's requirements pertaining to the proper use, fit and care of any protective equipment shall be followed by all the employees of the HART Sub-tier Partners. Requirements for any pre-use medical evaluations and other testing will be met as directed within the governing standards and project-specific documents.
- HART Sub-tier Partners shall provide all necessary protective equipment and clothing, required/directed by OSHA, documented Industry standards and project requirements, for use in the execution of their contract work.
- Employees of HART Sub-tier Partners of all tiers shall wear, as a minimum, ANSI Class II retro-reflective garments when performing work in outdoor locations that include mobile equipment. ANSI Class II retro-reflective garments are especially required whenever employees are exposed to the risk of moving traffic.

### **13.0 100% FALL PROTECTION**

Fall Protection Systems shall be utilized whenever an employee is exposed to a fall of six feet or greater. The approach to the elimination of a fall hazard should be addressed by evaluating the hazard to determine if the risk can be removed by using effective engineering and administrative controls. Personal Protective Equipment, such as Personal Fall Arrest Equipment should be regarded as a last alternative or least favorable solution. Personal Fall Arrest Systems equipment will protect an employee after they have fallen. Fall hazards must be effectively reduced to minimize the exposure to the employee.

#### **NOTE:**

**Fall Protection is required when any employee is working six or more feet above the walking level or main working surface, and/or whenever they are exposed to a potential fall of six feet or more.**

**Fall Protection is also required when any employee is working at a height of less than six feet, but with a fall exposure onto a dangerous surface (such as a concrete floor, or a tank of water), into or onto dangerous equipment (such as machinery), or falling into contact with any other hazard (such as exposed rebar, sharp edges or chemicals).**

Fall Arrest Systems that incorporate a Full Body Harnesses and shock-absorbing lanyard shall only be worn by employees that have been specifically trained by their employer in the proper use, application, fit, care/maintenance of Personal Fall Arrest/Restraint equipment. The training shall also include the recognition and understanding of the unique hazards associated with the use of Personal Fall Arrest equipment. Such training shall be documented and proof of such training will be required prior to use of Personal Fall Arrest equipment.

- All HART projects are ‘100% Tie-Off’ worksites, meaning that the employee’s body harness shall be fitted with connecting means (lanyards/Self Retracting Lifelines, etc.) to an appropriate anchorage point **100% of the time when working at elevation**, and shall be rigged in such a manner that an employee can neither free fall more than 6 feet (1.8 in), nor contact any lower level. HART Sub-tier Partners must plan their work accordingly. Anchorage points must support 5,000 pounds. Full body harnesses shall also be used when working within extendable and articulating boom platforms and scissors lifts. Full body harnesses will also be employed when using vertical life lines when working from suspended scaffolding, roof work and other sloped surfaces. HART policy specifies that the 6 ft. fall protection requirement also applies to all steel erection activities, leading edge work, roofing work and work on scaffolds.
- Rigging components that have been used for hoisting or securing any load shall not be used for Fall Protection purposes (chokers, beam clamps, eyes, shackles etc).
- Safety nets shall be provided when work places are more than **25** feet above the next closest working surface and the HART Sub-tier Partner has been able to prove that the use of other fall protection devices is impractical. The approval of HART’s Corporate Safety Director is required prior to the incorporation of safety net systems.
- Guard Rails, when installed, will be in accordance with the prevailing OSHA and construction trade standards, with top rail of 42” +/- 3” above the walking/working surface; mid rails similarly at 21” and complete with toe boards 4”.
- Hole Covers will be installed at any opening greater than two inches, secured in place and must be capable of supporting 2 times the weight of any anticipated load (personnel, material, worksite traffic, lifts etc). Hole Covers shall be fabricated and installed by the HART Sub-tier Partner creating the hole or gap. Hole Covers shall be maintained and replaced in suitable condition if displaced by any work. Any trade displacing an installed hole cover must replace it immediately.

#### **SIGNS, SIGNALS, BARRICADES & LIGHTS**

- Signs, signals and barricades shall be visible at all times where a hazard exists. All streets, roads, highways, and other public thoroughfares that are closed to traffic shall be protected by effective barricades on which shall be placed

acceptable and highly visible warning signs. Barricades shall be located at the nearest intersecting public highway or street on each side of the blocked section.

- All open trenches and other excavations shall be provided with appropriate barriers, barricades, signs, and lights to the extent that effective protection is provided to the public. Obstructions, such as material storage piles and equipment, shall be provided with similar warning signs and lights.
- All barricades and obstructions shall be illuminated by means of warning lights from sunset to sunrise. Materials stored on or alongside public streets and highways shall be so placed, and the work at all times shall be so conducted, as to cause the minimum obstruction and inconvenience to the traveling public.
- All barricades, signs, lights and other protective devices shall be installed and maintained in conformity with applicable statutory requirements and, where within railroad and highway right-of-way, as required by the cognizant Authority Having Jurisdiction.
- When any work is performed at night or where daylight is shut off or obscured, HART Sub-tier Partner shall, at its expense, provide and maintain artificial lighting effective to permit work to be carried on efficiently, satisfactorily and safely, and to permit thorough inspection. During such time periods the access to the place of work shall also be clearly illuminated. All wiring for electric light and power shall be installed and maintained in a first-class manner, securely fastened in place at all points, and shall be kept as far as possible from telephone wires, signal wires, and wires used for firing blasts. Temporary wiring and lighting circuits shall be tagged with information identifying the panel and breaker or other source of its power. Such tags shall be placed every 20' on the temporary wiring, or in the middle of the cable should it be less than 20' in length.
- Signs, signals and barricades shall be removed when the hazard no longer exists.
- HART Sub-tier Partner's employees working in an area of potential traffic hazard shall wear retro-reflective clothing compliant with of DOT/ANSI Class II regulations.

#### **15.0 RIGGING EQUIPMENT**

- All rigging equipment shall be free from defects, in good operating condition and maintained in a safe condition.
- Rigging equipment shall be inspected by a designated, competent employee of the HART Sub-tier Partner, daily prior to use, on the jobsite and documented monthly thereafter to ensure that it is safe. Records shall be kept on jobsite of each of these inspections by HART Sub-tier Partner and shall be made available to HART Project Manager upon request.
- The HART Sub-tier Partner's damaged rigging equipment shall be immediately removed from service by HART Sub-tier Partner.
- Tag lines shall be used to control all hoisted or lifted loads.

#### **16.0 HAND & POWER TOOLS**

- All hand and power tools, whether furnished by HART Sub-tier Partner, or by HART Sub-tier Partner's employees, shall be maintained in a safe condition, and inspected on a regular basis. Records shall be provided by the HART Sub-tier Partner to HART Project Manager upon request.
- HART Sub-tier Partners shall not issue nor permit the use of unsafe hand or power tools.
- Electrical power tools shall be grounded or double insulated with proper assured equipment grounding inspections and Ground Fault Interrupter circuit protection provided.
- Pneumatic power tools shall be secured to the hose or whip by some positive means.
- Only properly trained HART Sub-tier Partner's employees shall operate powder actuated tools. Certification records, employee certification cards, or equivalent certification documentation shall be maintained by HART Sub-tier Partner on each of its employees using power actuated tools during performance of the work.
- All grinding machines shall conform to OSHA and ANSI requirements.
- Cords, leads and hoses shall be kept at least seven feet off the ground or whatever height is necessary to be protected from traffic and creating tripping hazards.

#### **17.0 COMPRESSED GAS CYLINDERS**

- Compressed gas cylinders shall be secured in an upright position at all times. Location of cylinder storage areas must be approved by HART Project Manager.
- When transporting, moving and storing cylinders, valve protection caps shall be in place and secured.
- Cylinders shall not be hoisted by magnets or choker slings. Valve protection caps shall not be used for hoisting cylinders.
- Cylinders shall be kept away from sparks, hot slag and flames, or be adequately protected.
- Cylinders shall not be placed where they can become part of an electrical circuit.
- Cylinders shall be labeled as to the nature of their contents.
- Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible materials a minimum of 20 feet, or by a non-combustible barrier at least five feet high having a fire resistant rating of at least one-half hour and empty cylinders shall be separated as above from full cylinders and stored with like cylinders.
- Oxygen and acetylene cylinders shall be stored outside the building at a location designated by the local Fire Official.
- "No Smoking" signs shall be posted at storage areas and signs shall clearly indicate contents of cylinders.
- Flash Arrestors (Anti-flash back valves) shall be provided on all oxygen and

acetylene lines.

## **18.0 SCAFFOLDS**

- Scaffold Erection will be in compliance with OSHA Standard 1926.450. Workers erecting, dismantling or using scaffolds shall be trained in accordance with OSHA Standard 1926.450. Scaffolding shall be erected, moved or dismantled under the direction of a Competent Person qualified in scaffold erection.
- Footings or anchorage for any scaffold shall be sound, rigid and capable of carrying the maximum intended load without settling or displacement.
- No unstable objects such as concrete blocks shall be used to support scaffolds or planks.
- Any part of a scaffold weakened or damaged shall be repaired or replaced immediately.
- All scaffold planking shall be free of knots and cracks (Class A number) and shall completely cover the work platform.
- Scaffold planks shall be laid tight, cleated at both ends or overlapped a minimum of 12 inches and nailed or bolted to prevent movement, with overlaps occurring directly above scaffold supports.
- Safe access shall be provided to the scaffold platform with a safe means of access to the platform from the access.
- Scaffolds shall be equipped with a top rail made of lumber not less than 2 x 4 inches (or equivalent strength). Minimum top rail height 42 inches with a midrail of 21 inches high made of lumber not less than 1 x 6 inches (or equivalent strength); and toeboards shall be installed on all open sides and ends of scaffold platforms 6 feet or more above the ground or floor for scaffolds where the guard rail is the primary means of fall protection.
- Scaffolding not adaptable to guard rails shall require the use of safety harnesses with the lanyard attached to a secure substantial object.
- Mobile scaffold casters shall be secured and locked prior to mounting.
- No personnel shall be on mobile scaffolding when it is being relocated.
- HART Sub-tier Partners employees working swing stages, boatswain chair, floats, suspended scaffolds and needle beam scaffolds, etc., shall wear safety harnesses with lanyards attached to an independent lifeline.
- A proper scaffold inspection and tagging system shall be instituted and maintained by the HART Sub-tier Partner erecting or using the scaffold.

## **19. JOBSITE TRANSPORTATION RULES**

- Drivers of motor vehicles shall be instructed to exercise judgment as well as observe posted speed limits. Maximum speed limit is 10 mph, or otherwise posted. However, much slower speeds are necessary in congested areas.
- All mobile equipment, to include light-duty trucks and personal vehicles, shall be maintained in a safe operating condition and be fitted with evidence of a current

inspection. Mobile equipment and vehicles found to be operating in an unsafe condition (to include the absence of functioning reverse-motion alarms) shall be shut-down and/or removed from the work site until the deficiencies have been corrected and evidence of an appropriate current inspection is provided.

- All HART Sub-tier Partner's means of ingress and egress routes will be adequately marked as such, since their employees are to travel these routes only.
- Pedestrians and bicycles have right of way over motorized traffic.
- Vehicles operators approaching blind corners or other equipment working 'in-place' shall stop and sound their mobile equipment's/vehicles horn before proceeding.
- Established hand signals or turn signals are to be used.
- Ignition key is to be left in cars at all times when within any plant or worksite.
- HART Sub-tier Partner's employee's cars may be locked within the project's designated parking area.
- Reckless driving or other non-observance of these instructions will be cause for withdrawal of drive-in privileges and will result in the unsafe operator being barred from the worksite for the duration of the project.
- No two-wheeled motorized vehicles are allowed, other than in Sub-tier partner's perimeter parking lot. Any ATV's used on the jobsite shall be that of a four-wheeled configuration.

## **20. EQUIPMENT & MOTOR VEHICLES**

- All equipment must be inspected daily before use by HART Sub-tier Partner's operator. Formal inspections must also be made by HART Sub-tier Partner at 30-day intervals with proper documentation maintained at the jobsite by Sub-tier partner and copies shall be made available to HART Project Manager upon request.
- Defective equipment shall be repaired or removed from service immediately.
- All rubber-tired, self-propelled scrapers, rubber-tired, front-end loaders, rubber-tired dozers, wheel-type agricultural and industrial tractors, crawler tractors, crawler-type loaders and motor graders shall be equipped with rollover protective structures and seat harnesses.
- All HART Sub-tier Partner's operators of construction equipment, including forklifts, lulls, etc., must be properly licensed and certified by a competent person. Copies of the certifications shall be maintained on jobsite by HART Sub-tier Partner and made available to HART Project Manager upon request.
- All equipment with an obstructed view to the rear must have a reverse-motion alarm that is audible above the surrounding noise level or a qualified flagger.
- All cracked and broken glass shall be replaced before bringing vehicles on the jobsite. If glass is broken or damaged on jobsite and if damage is severe enough to cause a potential safety problem, the machine shall be stopped until such damage has been repaired.
- Vehicles used to transport employees shall have seats firmly secured and

adequate for the number of employees to be carried and all passengers should be properly seated. Standing on the back of moving vehicles is prohibited.

- Locations for storage of all fuels, lubricants, starting fluids, etc., shall be reviewed and approved by HART Project Manager prior to use by Sub-tier partner for storage.
- Seatbelts shall be worn by all employees operating any motor vehicle and any equipment with rollover protective structures during performance of the work.
- Visitors or vendors of the HART Sub-tier Partners and Sub-tiers shall complete and conspicuously post temporary parking pass issued by Hart Engineering Security within the vehicle.

## 21. ELECTRICAL

- All electrical work, installation and wire capacities shall be in accordance with the pertinent provisions of the National Electrical Code, ANSI and OSHA.
- HART Sub-tier Partner shall establish a monthly-assured grounding inspection program to include color-coding. The color codes used on this project are:  

January – White	April - Orange
February – Green	March - Red

(The cycle of colors is repeated for the remaining eight months).
- The HART Project Manager or the Owner shall require strict compliance by the HART Sub-tier Partners in the project-specific Lockout/Tagout Program.
- HART Sub-tier Partner shall implement the HART Project Manager’s Lockout/Tagout procedure and strictly adhere to the use of this procedure. The Project Manager will monitor adherence to the procedure on a regular basis.
- All temporary power panels shall have covers installed at all times. All open or exposed breaker spaces shall be covered in accordance with the OSHA/NFPA standards.

## 22. LADDERS

- The use of ladders with broken or missing rungs or steps, broken or split rails or other defective construction is prohibited.
- Ladders shall extend no less than 36 inches above landing and be secured to prevent displacement.
- Portable ladders must be equipped with safety shoes.
- Wooden and metal ladders are prohibited from use within the worksite.
- Metal or conductive ladders shall not be used on the jobsite.
- Stepladders: Podium and Platform ladders are to be used, as opposed to traditional ‘A-Frame’ stepladders.
  - a. Traditional ‘A-Frame’ stepladders are being phased out of general use at all HART worksites.



- Ladders shall be inspected regularly and records provided by the Sub-tier partner to HART Project Manager upon request.

### 23. **FLOOR & WALL OPENINGS & STAIRWAYS**

- HART Sub-tier Partners are required to replace any floor and wall openings or protective systems removed during the course of their work.
- Floor and wall openings shall be guarded by a standard guardrail, midrail, and toeboard, or adequately covered.
- Guardrails must be of sufficient strength to support 200 pounds of pressure when applied at midspan of the guardrail parallel with the floor and perpendicular to the guardrail with a minimum deflection of 3 inches.
- Covers must be compliant with the requirements of the prevailing OSHA standard (1926.500, Subpart M), adequately secured to prevent displacement and be complete with appropriate marking such as “HOLE” or “HOLE COVER” that warn of the hazard and feature information on ownership, such as HART Engineering; including a contact person and their information.
- Every flight of stairs having four or more risers shall be equipped with standard stair railings. Stairs are not to be used until risers and railings are securely installed. Treads will be poured as soon as possible where poured treads apply.
- Debris and other loose materials shall not be allowed on stairways or at access point to stairway. Debris shall not be allowed to accumulate in stairwells.

### 24. **HOUSEKEEPING**

This section is intended to give supervision and employees guidance in maintaining clear work areas, working and walking surfaces in order to provide a work site that presents a minimum amount of risk to personnel under any conditions.

In general, all trash, waste, and scrap must be placed in properly located trash receptacles. Traffic routes leading to and from all work locations must be effectively illuminated and clear of obstructions and debris.

- Keep tools and working materials in proper containers.
- Store trash, waste, scrap and packaging in proper containers.
- Remove from the worksite daily.
  
- Store materials safely.
- Put cigarette stubs in butt cans located in the designated areas.
- Keep small items in boxes or bins.
- Keep floors clear of tools, rod ends, metal shavings and general scrap.
- Keep walkways and working surfaces clear of obstructions and debris.
- Ensure that worktables are occupied only by work at hand and the

tools required for the work being done.

- Do not leave aerosol cans on lab tables.
- Properly store or contain combustible material to minimize the risk of fire.
- Clean up tools and work areas as your project progresses.
- Keep cords and hoses 7 feet overhead when possible, or lay them flat and out of walkways.
- Keep floors and walkways clear of unused electrical cords.
- Keep all material, tools and equipment in a stable position (tied, stacked or chocked) to prevent rolling or falling.
- Maintain clear access to all work areas.
- Keep stairways clear of debris.
- Contain and clean up liquid or other material spills immediately.
- Walking surfaces, (walkways and stairways) must be clear at all times.
- Ladders access must not be blocked.
- Emergency exits must be clearly identified and clear of all materials/debris.
- Access to any and all emergency equipment, fire extinguishers, alarm stations, electrical panels and/or electrical disconnect switch/boxes must be free of all obstructions.
- Stack, store, or spot material so that it can be accessed readily by workers and material-handling equipment.

### Safe Access

During the course of construction, all debris and scrap material shall be kept away from the work area.

- Containers shall be provided by HART Sub-tier Partner for the collection and separation of waste, trash, oily and used rags and other refuse. Metal (Dumpster type) containers must be used and emptied promptly.
- HART Sub-tier Partner shall notify HART Project Manager of any hazardous waste it will generate during performance of the work. The HART Sub-tier Partners have the direct responsibility of maintaining proper storage of these wastes while on site and will verify to HART Project Manager in writing that the wastes have been disposed of in a legal manner.
- HART Sub-tier Partner shall not pour, bury, burn, nor in any way dispose of a chemical on the work jobsite without the permission of Project Manager or Client.
- HART Sub-tier Partner shall clear all combustible debris to a solid waste disposal jobsite properly licensed and operated in accordance with established regulatory requirements.

**OPEN BURNING OF DEBRIS OR RUBBISH IS NOT PERMITTED AT THE PROJECT JOBSITE.**

- Materials and supplies shall be stored in locations, which will not

block accessways, and shall be arranged to permit easy cleaning of the area. In areas where equipment might drip oil or cause other damage to the floor surface, a protective cover of heavy gauge, flame resistant, oil proof sheeting shall be provided between the equipment and the floor surface sheeting so that no oil or grease contacts the concrete. This requirement is applicable to both finished and unfinished floors.

- All hoses, cables, extension cords, and similar materials shall be located, arranged, and grouped so that they will not block any accessway and will permit easy cleaning and maintenance.

## 25. FIRE PROTECTION

- HART Sub-tier Partner is responsible for the development of a fire-protection and prevention program conforming to OSHA and NFPA standards. Sub-tier partner shall also comply with all fire and safety rules and regulations established on the project.
- HART Sub-tier Partner shall be responsible for fire protection in its work and operational areas, including offices, tool rooms, and storage areas 24 hours perday, seven days per week through the duration of this Contract. Approved fire fighting equipment, in adequate quantities must be provided by Sub-tier partner, and its employees must be trained in the usage of such equipment. Any Recommended by the local Fire Marshall, HART Project Manager, or the Owner as a result of fire inspections (incl. Firewatch, fire access, etc.) shall be followed up and adhered to by the HART Sub-tier Partner.
- HART Project Manager reserves the right to regulate smoking, open fires, carrying matches, and welding permits when and where deemed necessary in the interest of safety. HART Sub-tier Partner shall be responsible for and so enforce —HART Sub-tier Partner’s personnel and their Sub tiers and visitors to comply with the regulations and restrictions as directed. These smoking, open fires and similar regulations may vary during the progress of construction, or during the testing, or initial operation of any portion of the plant.
- Within all areas on the HART project site the HART Project Manager will issue a “HOT WORK PERMIT” daily which will authorize open flames, burning and welding activities during regularly scheduled working hours. Smoking will be permitted only in designated compounds. “OPEN AREAS” shall be reclassified as “RESTRICTED AREAS” whenever designated by HART Project Manager and upon completion.
- No matches except safety matches are permitted on the jobsite.
- No flammable storage is permitted in office trailers.
- Flammables must be stored in approved, lockable storage cabinets.

## 26. JOBSITE CONDUCT

Practical jokes, horseplay, wrestling and fighting are prohibited in the worksite. All such

behaviors are grounds for immediate disciplinary action and may include dismissal.

Personal Conduct including but not limited to the following violations will be subject to appropriate disciplinary action and/or discharge from the work site;

- Willful misconduct.
- Failure to observe safety rules and regulations.
- Not wearing hardhat and safety glasses.
- Not wearing and/or connecting safety harnesses where required.
- Not wearing additional eye protection near welding, grinding, chipping, and other cutting operations.
- Ignoring barricaded areas.
- Removing grating or exposing floor and wall openings without properly barricading the area.
- Not wearing other equipment required by clients in existing facilities (hair nets, beard covers, shoe covers, etc.)
- Smoking in prohibited areas.
- Entering areas where construction employees are prohibited.
- Tampering with, or misuse of, fire extinguishers, fire prevention/protection and life safety equipment.
- Using other than provided sanitary facilities.
- Placing items in, or tampering with, drinking water cans.
- Engaging in horseplay and/or fighting.
- Possession or use of intoxicants, narcotics, fireworks, firearms, or other types of weapons within company or client premises.
- Theft or willful damage of company's, clients, or other employee's property.
- Falsely stating or making claims of injuries.
- Interfering with any accident investigation or investigator.
- Actions that may place other employees in jeopardy or that may lead to unsafe conditions or accidents.

**27. FIRST AID & INJURY REPORTING REQUIREMENTS; DIRECT, OCIPs and CCIPs**

**HART Sub-tier Partner's Responsibilities**

- A. The availability of medical personnel for advice and consultation will be provided by the HART Project Manager.
- B. Prior to commencement of work, make provisions for prompt medical attention in the event of serious injury.
- C. Ensure that at least one of HART Sub-tier Partner's company employees for each 15 employees performing work at the jobsite has a valid certificate in first aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be

verified by documentary evidence and is available at the jobsite to render first aid.

- D. Provide proper equipment for prompt transportation of injured person to a physician or hospital or a communication system to contact necessary ambulance service.
- E. Telephone numbers and addresses of the physicians, hospital and ambulances shall be conspicuously posted.
- F. HART Sub-tier Partners must orally notify the HART Project Manager's Superintendent or Safety Manager **IMMEDIATELY** after any injury to sub HART Sub-tier Partner's employee(s) or employee(s) of tier subs; equipment or motor vehicle damage; or fire or property damage.
- G. The injured's supervisor shall complete and submit a Supervisors First Report of Injury to the HART Project Manager. The HART Sub-tier Partner shall keep on file all "Employer's First Report of Injury" and Incident Investigations and provide HART Project Manager a copy **within 24 hours** of any such event.
- H. A daily record shall be kept on all employees requiring first aid treatment. HART Sub-tier Partner shall ensure that each of its lower-tier sub HART Sub-tier Partners Complies with these medical, first aid and reporting requirements.

**28. FIRST AID TREATMENT PROCEDURES**

**A. First Aid (minor cuts, scratches, bruises, etc.)**

- 1. Each occupational illness or injury shall be reported immediately by HART Sub-tier Partner's employee Project First Aid Professional.
- 2. All personal injuries and illnesses (job related) treated or reported (actual or alleged) shall be recorded on a daily First Aid log. This log should contain such information as employee's name, badge number, foreman, nature and cause of injury, treatment administered, date, time and first aid attendant's name. HART Sub-tier Partner shall maintain such data for HART Project Manager's review upon request.
- 3. The HART project site Project First Aid Professional shall treat the injured as often as necessary to ensure complete recovery, or the decision is made to seek medical treatment.

**B. Medical Cases Not Requiring Ambulance Service**

- 1. Medical cases not normally requiring ambulance services are injuries such as minor lacerations, embedded foreign bodies in eye, minor sprains, etc.
- 2. HART Sub-tier Partner must provide proper equipment for prompt transportation of the injured person to the designated medical Occupational Health and Rehab or other medical care/treatment provider.
- 3. A representative of HART Sub-tier Partner should always drive the injured employee to the medical facility and remain at the facility until the employee is ready to return. HART Sub-tier Partner's representative should also carry necessary forms, i.e., authorization slips, return to work notices, etc.
- 4. If it is necessary to call the medical facility to be utilized, this call should be made by a designated HART Sub-tier Partner representative while the

injured employee is being transported.

5. If the employee is able to return to the jobsite the same day, they should bring with them a statement from the doctor containing such information as date, employee's name, date they are able to return to work, regular or light duty, date he is to return to doctor (if applicable), diagnosis, signature and address of doctor. If the injured employee is unable to return to the jobsite the same day, the employee who transported him should bring this information back to the jobsite and report it to HART Project Manager.
6. HART Sub-tier Partner should designate one employee to keep files on all medical cases and retain all medical statements in this file. HART Project Manager will periodically check to ensure the HART Sub-tier Partner's medical files are being maintained.

### **C. Medical Cases Requiring Ambulance Service**

1. Medical cases requiring ambulance services would be such cases as severe head injuries, amputations, heart attacks, etc.
2. Should ambulance service be necessary, the following procedures should be taken immediately:
  - a. Contact HART project site Project First Aid Professional or nearest employee properly trained and certified in first aid.
  - b. While first aid is being administered, contact necessary ambulance service.
  - c. While the injured employee is being transported, HART Sub-tier Partner should contact the, medical facility to be utilized.
  - d. One designated HART Sub-tier Partner representative must accompany the injured employee to the medical facility and remain at the facility until final diagnosis and other relevant information is obtained.

## **29. CATASTOPHIC EVENTS: DEATH, AMPUTATION, AND HOSPITALIZATION (NOTE: Hospitalization: One or more team members 'Admitted For Care')**

- A. HART Sub-tier Partner shall notify the following proper officials immediately.
  1. OSHA Representative
  2. Coroner (for fatalities)
  3. Local Officials (for fatalities)
  4. HART Sub-tier Partner's First Aid Person
  5. Hart Engineering Project Manager, Superintendent and Safety Manager.
  6. HART project site Project Manager

## **30. CASE MANAGEMENT & RETURN-TO-WORK PROGRAM**

The purpose of our Case Management & Return-to-Work Program is to provide direction for HART Sub-tier Partners to assist their injured employees in early rehabilitation of their injury and faster return to the full-duty work force without jeopardizing medical recuperation. The following procedures provide direction for HART Sub-tier Partners to follow for an effective and efficient Return-to-Work Program that meets State laws in Workers' Compensation, as well as discrimination laws for accommodation of handicapped persons.

Modified duty jobs are designed for injured workers only. They are temporary alternatives for full-duty work. A time limit of six (6) weeks should be considered maximum for this assignment. An evaluation of the employee's medical condition on a bi-weekly basis and extension of the modified duty assignment will be on a case-by-case basis. If the employee cannot be released to full-duty status, the modified duty job is re-evaluated and a determination made regarding the need to refer the employee for rehabilitation services.

### **General Return To Work Procedures**

Each HART Sub-tier Partner/vendor of any tier is responsible for implementing the Return-to- Work Program on the project. Work that is assigned to their injured employees must be within the physical restrictions specified by the physician. If the medical release is unclear, please contact the physician and review with HART Sub-tier Partner's own insurance company administrator and HART Project Manager's Office.

#### **I. Procedures Following an Injury**

##### **I. HART Sub-tier Partner Superintendent/Supervisor**

1. The HART Sub-tier Partner Superintendent/Supervisor shall assess the medical emergency, secure first aid and shall coordinate with HART Project Manager for the transport of the injured employee to medical assistance.
2. Injured team members are not permitted to 'self-transport' after any incident to treatment or any other location.
3. Supervision, or supervision's designated team member, shall transport and travel with the injured employee to treatment. These persons shall help provide employer, employee and insurance information.
4. Supervision, or supervision's designated team member shall stay with the injured employee to arrange transportation home, if required, and to get the treating physician's diagnosis as to the extent of injuries and possible recovery time.
5. The HART Sub-tier Partner Superintendent/Supervisor shall see that the accident is properly investigated and reported to Construction Manager immediately. If accident-related drug testing is required, the HART Sub-tier Partner Superintendent / Supervisor sees that this is done in a timely manner.
6. The HART Sub-tier Partner Superintendent/Supervisor shall notify the HART Project Manager Project Superintendent and Safety Coordinator and their own insurance administrator of:
  - a. Questionable injury;
  - b. Possible third party responsibility;

- c. All communications and correspondence from the treating physician and facility
7. The HART Sub-tier Partner Superintendent/Supervisor shall coordinate with their respective Project Superintendent or Safety Coordinator to return the injured worker to a modified job, based on the physician's evaluation and recommendation, and notify HART Project Manager Office of this assignment.
8. The HART Sub-tier Partner Supervisor shall continue to work with his/her Project Superintendent and/or Safety Coordinator to identify tasks suitable for injured workers with varying levels of physical limitations.
9. When the worker is fully recovered and released by the physician for regularly assigned duty, the HART Sub-tier Partner Supervisor shall return the worker to the job, using and/or incorporating any further prescribed work conditioning and strengthening processes.

**II. Sub HART Sub-tier Partner Employee**

1. The injured employee, when able, shall assist the Sub Sub-tier partner Supervisor and/or Project Safety Coordinator with accident facts.
2. The employee assists with getting the following modified work program forms to the treating physician:
  - a. Physician notification letter
  - b. Modified duty, identified job tasks
3. The injured employee assists with seeing that the forms listed above are completed by the treating physician and submitted to the HART Sub-tier Partner Superintendent and/or Subcontractor/Sub-tier partner's Safety Coordinator promptly.
4. The employee shall carefully follow the physician's guidelines and restrictions for modified work and shall faithfully report for all appointments required for medical treatment, therapy and evaluation.
5. Realizing that full recovery is beneficial to both the individual and the employer, the injured worker shall agree to follow the physician's recommendations and requirements for recovery, both at home and at work.

**III. HART Sub-tier Partner Safety Coordinator**

(if none, then these are performed by HART Sub-tier Partner Supervisor)

1. HART Project Manager Superintendent and Safety immediately
2. Shall regularly call or visit the injured worker to assist with needs and recovery.
3. The Project Sub HART Sub-tier Partner Superintendent or Safety Coordinator shall supply all program forms and shall see that the employee is properly notified of:
  - a. Availability of modified work;
  - b. Release of the injured worker to enter the Company



program

- c. Such notification will be made using the Employee Notification of Release to Modified Work form.
4. If employee remains on time loss benefits over fourteen (14) days, the HART Sub-tier Partner shall have his/her insurance administrator contact his/her respective insurance company Claims Examiner and facilitate further claim activities. Coordination should continue between the insurance company, the HART Sub-tier Partner Project Superintendent/Safety Coordinator and the HART Sub-tier Partner's immediate supervisor.
5. Copies of all completed Modified Work Program forms shall be provided to HART Project Manager and to HART Sub-tier Partner's respective insurance company to assist in claim processing.
6. The HART Sub-tier Partner Insurance Administrator shall regularly check with their respective insurance company Claims Administrator and the injured employee to monitor medical status, recovery and return to regular duties.

#### **IV. Upgrading Modified Duty Release To Full Duty Status**

1. If the injured employee has gradually taken on an increasing work load with his/her physician's permission and is now doing regular duty work, then the employee shall obtain a signed regular duty work release from the physician. A copy of the work release is to be given to the HART Sub-tier Partner's insurance administrator, its Superintendent, Safety Coordinator with a copy to its insurance company and Construction Manager.
2. If the injured employee is not gradually taking on regular duties, he/she must see his/her physician at least every fourteen (14) days to obtain a continued Modified Duty release with current restrictions. These restrictions must be in writing from the physician and returned to the HART Sub-tier Partners insurance administrator, HART Sub-tier Partner's Superintendent/Safety Coordinator and HART Project Manager.
3. Modified duty is restricted to a maximum of six (6) weeks, at which time the HART Sub-tier Partner and its insurance company should make a complete review of the case and a formal decision concerning further modified work employment.

#### **Index of Potential Modified Duty Assignments**

- |                                  |                                |
|----------------------------------|--------------------------------|
| - Construction Drawing Detailer  | - Protocol (Cleanroom) Monitor |
| - Cleanroom Garment Distribution | - Rebar Capper                 |
| - Curing Compound Sprayer        | - Road Sign Setter             |
| - Equipment Spotter              | - Safety Assistant             |

- Fire/Safety Watch
- Fire Watcher
- Flagger
- Floor Mopper/Waxer
- Jobsite Records Filing
- Material Requisitioning/Ordering
- Mechanic Assistant
- Parts/Equipment Sorter
- Washdown
- Plastic Cover Layer
- Pre-paint Surface Preparer
- Material List Preparation (Take-Offs)
- Logistics Assistant
- Seam Caulker
- Sign Preparer
- Sign Painter
- Site Cleanup (sweeping/washing site/trailers)
- Supply Collector/Inventory
- Telephone Answerer
- Time Keeper
- Tool Maintenance
- Vehicle Driver
- Water Applicator/Equipment
- Planning Assistant
- Work Packaging
- Material Receiving Coordinator

NOTE:

The above partial listing of possible ‘Return To Work’/’Modified Duty Alternatives’ must also be reviewed with the following: (trades jurisdiction considerations notwithstanding.)

- nature of the injury,
- any related limitations or restrictions,
- training requirements, and
- the availability of these alternative duties
- any other reasonable and prudent circumstances

**EMPLOYEE NOTIFICATION OF RELEASE TO LIGHT/MODIFIED WORK**

EMPLOYEE NAME: \_\_\_\_\_

EMPLOYEE ADDRESS: \_\_\_\_\_

EMPLOYEE CONTACT PHONE: \_\_\_\_\_

PROJECT NAME/ADDRESS: \_\_\_\_\_

EMPLOYER’S NAME/ADDRESS: \_\_\_\_\_

Date Able to Return to Full Duty: \_\_\_\_\_



### **31. Project Disciplinary Policy**

The HART Companies remains committed to providing a safe workplace for our employees, and those of our subcontractors and vendors, that work with us. HART Companies understands that, from time to time, there may be circumstances that will require disciplinary actions as a result of willful infractions of this Safety Program.

All disciplinary action must be conducted in accordance with the constructive steps outlined in this section. HART takes the position of positive reinforcement through progressive, documented counseling, which may include education and/or re-training, in order to develop a person's understanding of the program requirements.

It is the responsibility of the respective project/work site management and supervisory teams to assure that all employees have read, understand and are in compliance with the requirements of the HART Safety Program.

Infractions of these requirements that may have a significant impact on our people, our ability to work as a team, or that are considered 'Serious' or 'Willful' will be addressed in the following manner;

- Progressive Discipline; For those instances that are considered to be an infraction of

the program requirements, but are regarded as less than serious in severity.

- Immediate Disciplinary Action; Including termination of employment and/or restitution may be taken for instances regarded as serious, immediately life threatening or specific behavior listed as requiring Immediate Action which may include removal from the workplace. Removal may be short-term (suspension) or long term (termination/removal from the HART workforce).

#### ADMINISTRATION

HART will review each instance on an individual basis and reserves the right to impose any discipline on the offending party it determines to be appropriate; to include termination of work or contract.

The initial Safety Orientation conducted upon hire, or upon reporting for work at an assigned worksite, shall serve both as a review of the requirements of the HART Safety Program and as an individual's 'Verbal Warning.'

Site Specific Safety Orientations may include further requirements at the request of the contract owner, a controlling contractor or other authorities having jurisdiction. Such conditions may also include positive worksite access control, work permits, employee identification/badging and certain additional health/safety provisions.

The discipline program for HART Companies' employees is outlined further, and contains Progressive and Immediate measures;

#### PROGRESSIVE DISCIPLINE:

- First Offense          Written Warning
  - o HART maintains the right to remove any person(s) including management or supervision, from any worksite on a first offense if the infraction is considered as "Willful" or "Serious"
- Second Offense        One Day Suspension
  - o HART maintains the right to extend the initial period of suspension, in keeping with the severity of the infraction.
- Third Offense         Permanent removal from the worksite and dismissal from HART.

Progressive Discipline notices will be signed by the individual committing the infraction, their supervisor, and a HART cognizant project or corporate representative.

#### IMMEDIATE DISCIPLINARY ACTION:

There are certain instances that must result in the removal of any employee, HART's or otherwise, from any worksite. Employees removed from the workforce for these instances may not work for HART, nor at any HART controlled worksite, in the future;

- Any individual that directly exposes themselves and/or others to any circumstance of eminent danger.

- Any individual that displays or exhibits contempt, disregard, disrespect or other defiant behavior for the HART Safety Program.
- Any individual that willingly or knowingly falsifies any investigation's interview statements, testimony or related documents.
- Any violent confrontations and/or physical encounters, such as fighting. In this instance all involved individuals are subject to dismissal.
- Any individual that threatens or otherwise obstructs a safety representative from any company or other organization that may be involved with HART's program.
- Any individual confirmed of willful property destruction or theft.
- Any individual that is found to be under the influence of, or to have consumed, possessed or distributed, drugs/alcohol/other controlled substances at the workplace/premises.

Immediate Disciplinary Action notices are to be signed by the individual committing the infraction, their supervisor, and a cognizant HART project or corporate representative. Should the offending individual refuse to sign such a document, that refusal shall be interpreted as acknowledgement of the notice and acceptance of the dismissal action.

Personnel not in the direct employ of HART Engineering Corporation will be subject to the disciplinary program outlined in the following related subsection.

**SUBCONTRACTOR, VENDOR AND OTHER PERSONNEL:**

The disciplinary process of non-HART personnel, including the determination and assessment of related fine(s) is outlined below;

HART project-related activities, to include subcontractors and vendors, are reminded that HART maintains the right of immediate and permanent removal of their personnel in the event of certain Imminent Danger violations.

- Project Safety Orientation: Verbal Notification of Requirements
- First Violation: Written Notification to the violator and the employer.
- Second Violation: Fine Assessed in accordance with the established schedule.
- Third Violation: Re-Assessment of fine(s) in accordance with the role of the individual and the established schedule (below). Action may include doubling the previous fine and/or require the immediate/permanent removal of the individual from all HART worksites. Repeat infractions of the HART Companies Corporate Safety Program may result in the loss of work and/or termination of the sub-tier's contract.

Fine Schedule:

**SCHEDULE OF INFRACTIONS AND FINES**

<b>OBSERVATION</b>	<b>1st INFRACTION</b>
PPE - Missing(Hard hat/Safety Glasses)	\$100
PPE - Hand Protection Missing	\$100
PPE - Hearing Protection Missing	\$100
PPE - Improper Clothing	\$100

PPE - Defective or Improper Footwear	\$100
Cranes – Crane Package Not Received	\$200
Cranes – Lift Plan Infraction	\$500
Cranes – Third Party Inspection Not Current, Not Present	\$500
Cranes – Copy of Operator Certification Not Provided/Refused	\$500
Cranes – Support/Stabilization Infraction	\$500
Cranes – Load Testing Not Completed When Required (i.e. Personnel Lift)	\$1000/Dismissal
ELEC – Assured Grounding Plan Infraction	\$200
ELEC - Defective Electrical Cord	\$200
ELEC – Devices/Equipment Not Protected/Covered As Required	\$200
ELEC - Electrical Cord Not Protected/Raised	\$100
EQPT – General Deficiency	\$100
EQPT – Deficient Tools	\$100
EQPT – Worker Not Sufficiently Trained for Equipment/Tools/Process	\$200
EQPT – Scissors/Boom-Lift Daily Inspections Not Completed Prior to Use	\$200
EQPT - Improper Cylinder Use, Storage, Identification	\$100
Excavation – Competent Person Not Identified	\$500
Excavation – Daily Soils Review Not Completed	\$500
Excavation – Trenching Infractions	\$500
Excavation – Standing Water Not Removed	\$500
Excavation – Daily Equipment Inspections Not Done	\$200
Fall Protection – Protective System Missing	\$200
Fall Protection – Guardrails/Toe Boards Missing	\$500
Fall Protection – Scaffolding: Improper Use/Protection	\$500
Fall Protection – Scaffolding: Daily Inspection Required	\$500
Fall Protection – Open Holes, Defective/Missing Covers	\$1000
Fire Protection - Extinguisher Missing/Defective	\$100
Fire Protection – Fire Watch Required, Not Present	\$100
Fire Protection - Hot Work Permit Not Posted	\$100
General Duty Clause Infraction	\$200
Health - Food Consumption in Prohibited Area	\$100
Health – Body Waste Elimination (Urination/Defecation)	\$500/Dismissal
Health – Smoking Policy Infraction	\$300/Dismissal
Housekeeping - Workplace not clear of debris/hazards (Backcharge + Fine)	\$100
Housekeeping – Materials Storage	\$200
HAZCOM – Program Not On-Site	\$200
HAZCOM – Inadequate Training of Employee	\$200
HAZCOM – MSDS Missing for Compounds in Use	\$200
Ladder - Defective	\$200
Ladder - Improper Use	\$200
Ladder - Unsecured	\$200
Safety Program – General Infraction	\$200
Safety Program – Accident Reporting Infraction (Failure to report as required)	\$300
Safety Program – Drug/Alcohol/Controlled Substance Infraction	\$1000/Dismissal
Safety Program – Workplace Violence Infraction	\$1000/Dismissal
Safety Program – Job Hazard Analysis Not Completed	\$200
Safety Program – Lock-Out/Tag-Out and/or Linebreak Procedure Violation	\$500
Safety Program – Obstruction or Threats to any Safety Representative	\$1000/Dismissal
Safety Program – Public Protection	\$500
Safety Program – Refusal to Comply with Direction Provided	\$500

Safety Program – Safe Access	\$200
Safety Program – Site Specific Orientation Not Done	\$200
Safety Program – Toolbox Talks Not Done/Received	\$100
Safety Program – Vehicular Infraction	\$200
Safety Program – Use of Radios, Walkmans, Cell Phones or other Distracting Electronic Device, not specifically required for worksite communications.	\$200
Workforce Training – Employee Not Properly Trained For The Task Assigned	\$200

#### ADMINISTRATION:

All assessed fines are not to be paid by the individual, their respective foreman or superintendent.

All assessed fines must be paid with a separate corporate check from the violator's company's office.

The check addressing the infraction and related fine must be delivered by a corporate-level representative (project manager or more senior staff) to the HART Corporate Safety Director's Office.

Requisitions for payment will not be released until the Safety Infraction(s) have been reviewed, settled and the fine has been received.

#### USE OF FUNDS:

All moneys realized from assessed fines are to be used to fund Safety Reward and Incentive programs that recognize individual workers, or work crews, that have demonstrated a commitment to safety in the workplace.

Any such funds that remain unexpended at the conclusion of a project shall be given as a donation to a local charity on behalf of the project's workers and contractors.

#### DISPUTES:

Any subcontractor, vendor or other project-related activity, may request an informal conference to review or dispute an observed infraction of the HART Safety Program by their personnel.

The subject dispute will be reviewed and resolved solely by the HART Companies' Corporate Safety Director.

The HART Companies' Corporate Safety Director's end determination of the review shall be final, with decisions not open to further collective action.



## **Basic Safety Rules & Regulations**

The HART Sub-tier Partner, as a condition of employment, will be required to comply with all Applicable Federal, State, County, Municipal, Client and HART Sub-tier Partner and/or Construction Manager's SAFETY RULES AND REGULATIONS. (NOTE: Federal OSHA Standards are referenced, however, the more stringent of State, Owner or Local Safety Codes will also apply.)

HART Sub-tier Partners found in non-compliance with any of the applicable rules and regulation will receive either an oral or written "Notice of Violation." Failure to abate the violation or continued failure to comply with the Basic Safety Rules and Regulations may result in a monetary fee. Monetary fees, if assessed, will only be used to fund programs at the jobsite to promote Safety. Any fees assessed shall not be construed as limiting HART Project Manager's remedies available at law or in equity, nor shall such fees be construed as liquidated damages.

The following is a list of the Basic Safety Rules and Regulations, many of which carry the potential for a monetary fee:

1. HART Sub-tier Partner shall submit its company SAFETY PROGRAM/HAZCOM PROGRAM and designate its Jobsite Safety Coordinator prior to starting work.
2. All job related ACCIDENTS AND INJIIRIES shall be reported to the HART Project Manager's Project Superintendent immediately and a copy of all injury reports shall be submitted to the Project Superintendent within 24 hours of the occurrence.

3. HART Sub-tier Partner's employees must report all 'UNSAFE CONDITIONS' AND 'NEAR ACCIDENTS' to their supervisor and the jobsite safety officer so that corrective action can be taken.
4. HART Sub-tier Partner's employees shall attend any jobsite SAFETY ORIENTATIONS as required. HART Sub-tier Partner's supervisors shall attend HART Project Manager WEEKLY SAFETY MEETINGS. Successful-Bidder must hold a "Weekly Tool-Box Safety Meeting" and submit for record those employees who have attended, along with a list of topics and related information discussed.
5. Copies of CERTIFICATIONS FOR SPECIALIZED TRAINING required to perform certain types of hazardous work or operate certain tools and equipment may be required to be submitted prior to work commencing.
6. HART Sub-tier Partner shall provide all required PERSONAL PROTECTIVE EQUIPMENT (PPE) (i.e. head, hearing, eye and face protection) to his employees for their use in order to perform their work safely and in compliance with local and federal codes of safe practice and manufacturers recommendations. All equipment shall be in good working order and all defective equipment shall be discarded and removed offsite immediately.
7. HEAD PROTECTION: Hard Hats (ANSI Z89.1) shall be worn at all times while on site. Alterations or modifications of any hard hat or liner shall be prohibited.
8. EYE PROTECTION: Safety Glasses, Goggles and Face Shields (ANSI Z87.1+) must be required to be worn 100% of the time at all HART worksite locations, and also inside or around existing manufacturing facilities.
9. HEARING PROTECTION: shall be worn in areas where noise levels exceed 80 dBA, where noise exposures to 85-90 dBA exceeds 8 hours per day, or where posted/required.
10. All workers must wear CLOTHING having adequate protection to the body. Sturdy trousers, and shirts with a minimum of a 4" sleeve are required. Sweat pants, tank tops, cut-off shirts, shirts without sleeves or shorts are not allowed.
11. FOOT PROTECTION: Sturdy work boots, with a substantial sole and rise high enough to support the ankles are required. The boots must have toe and other protections as appropriate to the level of workplace and task related hazards. Low-quarter work shoes, sneakers, sandals, and other footwear are not permitted.
12. HART Sub-tier Partner must implement a RESPIRATORY PROTECTION PROGRAM per OSHA standards as required by their respective trades and working conditions in field.
13. "HORSEPLAY" on the jobsite is strictly prohibited. No running on jobsite unless extreme emergencies warrant. Fighting on construction premises will result in immediate dismissal of employee, who shall be excluded from all Construction Manager's construction projects.
14. HART Sub-tier Partner shall provide FALL PREVENTION barricades, covers, rails, etc. to protect all roof, floor or wall openings, pits, holes, etc., that have resulted from their work performance. Unsafe conditions must be corrected immediately.

15. HART Sub-tier Partners of any tier shall design, provide and ensure workers utilize PERSONAL FALL ARREST SYSTEMS (harnesses, Self-Retracting Lifelines, etc.) to ensure 100% fall protection at levels 6 ft. or more above lower levels, for their activities, where permanent or temporary fall prevention is not in place.
16. FIREARMS, ALCOHOLIC BEVERAGES OR ILLEGAL DRUGS are not allowed on site. Personnel, vehicles and equipment are subject to search upon entering or leaving and while on the site premises. The use of alcohol beverages or the use and possession of illegal drugs during the workday, either on site, during breaks or lunch, or before work, is prohibited. Anyone caught using illegal drugs or alcohol, during any of these times is subject to immediate termination or dismissal from the site indefinitely.
17. All HART Sub-tier Partners shall keep their respective areas clean and hazard free. HOUSEKEEPING will be done on a daily basis or more frequently if conditions warrant. Failure to do so may result in a back-charge to the HART Sub-tier Partners. Involved, for any clean-up that may directed by HART Project Manager.
18. All TOOLS, whether company-owned or personal, must be in good working condition. Defective tools, such as chisels with mushroom heads, hammers with split or loose handles, saws or grinders missing guards, must not be used and shall be immediately removed from the worksite.
19. Ground Fault Circuit Interrupters (GFCI's) shall be used on all extension cords, electric tools and portable electric equipment powered from a temporary electric service or generator. Tools and equipment shall be inspected each week by a competent person for defects. If electrical power is used from permanent power system or existing building, the sub HART Sub-tier Partner shall provide a GFCI system between his equipment and permanent power. Substitution of an "assured grounding program" in lieu of 100% GFCI protection requires authorization from HART Project Manager and compliance to OSHA.
20. PERMITS, written and properly authorized may be required for work of any type including welding and open flame, electrical "HOT WORK", excavation, confined spaces, cranes, lockout/tagout, blasting, fire protection water, powder-actuated tool, etc. Check with HART Project Manager for work permits required.
21. HART Sub-tier Partner must obtain "HOT WORK" PERMIT for all open flame work as required by the Project Superintendent's Jobsite Safety Coordinator. During welding, burning, soldering, cutting, grinding, or using gas heaters or salamanders, adequate fire prevention precautions must be implemented, consisting of removal of flammables and combustibles, protection of adjacent areas, appropriate fire extinguishers or standpipes, and similar measures. If these are not employed, then a fire watch, equipped with an approved portable fire extinguisher is required during, and for a sufficient time after, the welding, burning, cutting or grinding operation.
22. BURNING AND CUTTING EQUIPMENT shall be inspected daily before being used. All hoses and manifolds shall be removed from bottles and protective caps replaced at end of each day. Flash Arrestors are required at the tool-tip and

regulator ends of all fuel line hoses.

23. Connections of COMPRESSED AIR HOSES shall be properly secured to prevent any accidental disconnection.
24. LOCKOUT/TAGOUT procedures are in force and shall be followed to protect persons from injury due to inadvertent operation of power-driven equipment, opening of pipeline valves, or energizing of electrical circuits. Coordinate this procedure with HART Project Manager.
25. ELECTRICAL “HOTWORK” is not allowed in accordance with HART Companies’ Safety Program policies. Proximity work to electrical equipment is also not allowed without written approval from HART Project Manager.
26. HART Sub-tier Partner shall provide its own LADDERS, which must be in accordance with OSHA and ANSI specification. All ladders must be in safe condition without broken or defective rungs, rails and hardware. No metal ladder shall be used in or around any electrical work. Ladders shall be secured top and bottom and extend three feet (3’) past the walking surface. All ladders shall be TYPE IA and TYPE IAA duty rating, regardless of ladder type.
27. SCAFFOLDING of all types shall be provided, erected and used in accordance to OSHA 29CFR 1926, Subpart L.
28. CONFINED SPACE procedures are in force and require an entry permit from HART Project Manager. Confined spaces include manholes, vessels, ductwork, etc., where such hazards as oxygen deficiency, hazardous gases, contamination, high temperatures, fire and difficulty in escaping are involved.
29. HAZARDOUS MATERIALS procedures are in force and protection of all personnel regarding acids, corrosives, flammables and toxics shall be per OSHA 29CFR 1926, Subpart D (Hazard Communication).
30. All WARNING SIGNS, barricades and tags will be used to the fullest extent and shall be obeyed.
31. All EARTHMOVING AND COMPACTION EQUIPMENT must have working alarm, horns, and protective devices in compliance with OSHA 1926.602 standards.
32. All TRENCHES/EXCAVATIONS shall be in accordance with OSHA 29CFR 1926, Subpart P with particular emphasis on excavations over 5’0”, and sloping requirements. “DIG SAFE”, utility companies and facility owner must be notified for verification of utilities prior to digging.
33. All CONCRETE AND MASONRY CONSTRUCTION shall be in accordance with OSHA 29CFR 1926, Subpart Q, with particular attention to general requirements of construction loads, guarding of reinforcing steel to eliminate the hazard of impalement, personal protective equipment, fall protection for erecting reinforcing steel and limited access zone for masonry construction
34. ROOFING WORK shall be performed in accordance with OSHA 29CFR 1926.500 (g) with special / emphasis for provision by the roofing Sub-tier partner of a motion stopping safety system, warning lines and safety monitoring system.

35. All Crane Operations shall conform to the 29 CFR 1926.1400 “Cranes In Construction” OSHA standard. All Lifts Must Be Planned. All Cranes shall have a current Certification Sticker by an independent crane certification company, have a current maintenance log, required swing radius protection. Copies of inspections, crane operators trades licenses, industry certifications, and employer evaluations and qualifications are required before any crane activity begins.
36. FLAMMABLE LIQUIDS shall be stored in approved metal safety cans and contents shall be labeled by NFPA standards. Indoor storage of flammable or combustible liquids, if permitted, shall not exceed 25 gallons unless stored in approved cabinets.
37. VENTILATION METHODS shall be provided by the HART Sub-tier Partner whenever hazardous substances such as dusts, fumes, mists, vapors or gases are produced in the course of the HART Sub-tier Partner’s work. Provide fans, ducts or other means and exhaust substances to the outside. See OSHA 1926.57 for details.
38. SEXUAL HARASSMENT, including verbally or physically offensive behavior on the jobsite, is prohibited. Failure to adhere to this policy may result in the dismissal of the offending employee(s) from the jobsite.
39. Failure to report a FIRE or discharged FIRE EXTINGUISHER after use shall result in a fine assessed to the HART Sub-tier Partner.
40. ALL OTHER SAFETY REQUIREMENTS, in addition to those within the prevailing OSHA regulations shall be complied with at all times by HART Sub-tier Partner/vendors of any tier and their employees.

- END OF SECTION -

## **SILICA EXPOSURE CONTROL PROGRAM**

### ***Purpose***

The purpose of this program is to prevent employee exposure to hazardous levels of Respirable Crystalline Silica (silica) that could result from construction activities or nearby construction activities occurring on HART jobsites. It is intended to meet the requirements of the Respirable Crystalline Silica Standard for Construction (29 CFR 1926.1153) established by the Occupational Safety and Health Administration (OSHA).

All work involving chipping, cutting, drilling, grinding or similar activities on materials containing silica releases harmful silica dust. Silica is the second most common mineral on earth, found in common form as quartz, sand and rock (e.g., soil, sand, granite and many other materials). Many materials found on construction sites contain silica including, but not limited to, cement, concrete, asphalt and pre-formed structures (e.g., inlets and pipe). This program has been developed to address and control these potential exposures to prevent HART employees from experiencing the effects of occupational illnesses related to silica.

### ***Scope***

This program applies to all occupational exposures to silica in construction work, except where employee exposure will remain below the OSHA Action Level (AL) of 25 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

Effective engineering controls such as substitution, automation, enclosed systems, local exhaust ventilation, wet methods and work practices will be the primary methods used to ensure that worker exposures will not exceed the OSHA permissible exposure limit (PEL) of  $50 \mu\text{g}/\text{m}^3$  as an 8-hour TWA. Whenever engineering and/or work practices cannot reliably and consistently keep exposures below the OSHA PEL, controls will be supplemented with the use of respirators.

### ***Responsibilities***

HART firmly believes that protecting the health and safety of our employees is everyone's responsibility. This responsibility begins with upper management providing the necessary support to properly implement this program. However, all levels of the organization assume some level of responsibility for this program including the following positions.

## SAFETY DEPARTMENT

- Work with and the support the Silica Competent Person in conducting jobsite assessments for silica containing materials and perform employee silica hazard assessments in order to determine if an employee's exposure will be above 25 µg/m<sup>3</sup> as an 8-hour TWA under any foreseeable conditions
- Review the Silica Competent Person's selection and implementation of the appropriate control measures in accordance with the tasks identified in OSHA's Respirable Crystalline Silica Standard for Construction Table 1 (Table 1), to include a written exposure control plan (ECP), exposure monitoring, hazard communication training, medical surveillance, housekeeping and other requirements
- Ensure that the materials, tools, equipment, personal protective equipment (PPE) and other resources required to fully implement and maintain this silica program are in place and readily available if needed
- Ensure that Project Managers, Site Managers, Competent Persons and frontline employees are educated in the hazards of silica exposure and trained to work safely with silica in accordance with 29 CFR 1926.1153 and OSHA's Hazard Communication Standard (29 CFR 1910.1200)
- Maintain written records of training, ECPs, inspections, medical surveillance, respirator medical clearances and fit-test results
- Conduct an annual review (or more often if conditions change) of the effectiveness of this program. In addition, conduct annual reviews of all active project-specific ECPs that extend beyond a year. This includes a reviewing feasible dust controls and updating equipment as technology progresses
- Coordinate work with other jobsite employers, contractors and subcontractors to ensure a safe work environment for all, relative to silica exposure

### Project/Site Superintendent(s)/Manager(s)/Foremen

- Ensure all applicable elements of this program are implemented on the project
- Assigning the jobsite Silica Competent Person
- Assist the Safety Department in conducting jobsite assessments for silica-containing materials and perform employee silica hazard assessments
- Assist in the selection and implementation of the appropriate control measures in accordance with tasks identified in Table 1, a written ECP, exposure monitoring, hazard communication training, medical surveillance, housekeeping and other requirements
- Ensure that employees using respirators have been properly trained, medically cleared and fit-tested in accordance with the company's Respiratory Protection Program

- Obtain a copy of the exposure control plan from subcontractor employers.
- Ensure that work is conducted in a manner that minimizes and adequately controls the risk to workers and others. This includes ensuring that workers use appropriate engineering controls, work practices, follow procedures for restricted areas and wear necessary PPE
- Where there is risk of exposure to silica dust, verify employees are properly trained on the applicable contents of this program, the site-specific ECP and the applicable OSHA Standards (such as Hazard Communication)

Other Team Members, Workers are responsible for compliance with the silica exposure control plan. Specific responsibilities include:

- Attending required orientation/training sessions that review silica producing tasks and associated hazards.
- Using and maintaining assigned PPE for prevention of silica exposure, in a safe manner.
- Performing tasks/operations following the silica exposure prevention plan.
- Becoming familiarized with conditions or procedures that could potentially expose workers to silica.
- Notify site supervision if the work in which they are involved has not been properly evaluated for silica dust exposure or believe they have been exposed to silica dust.
- Follow recognized work procedures (such as using equipment according to manufacturer specifications) as established in the project's ECP and this program
- Participate in silica exposure monitoring and the medical surveillance program
- Report any unsafe conditions or acts to the Site Manager and/or Competent Person
- Report overexposure incidents and conditions
- Report signs or symptoms of silica illness

### Competent Person(s)

The competent person(s) is an individual who is capable of identifying existing and foreseeable silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them. The competent person must have the knowledge and ability necessary to fulfill the responsibilities set forth in HART's written ECP. The Competent Person will make frequent reviews and regular inspections of jobsite(s), materials and equipment to implement this program.

Silica Competent Persons will be responsible for ensuring the requirements of this program are in effect on their respective jobs. Competent person responsibilities include:



- Identification of any known and/or anticipated respirable silica hazard related to a job or task.
- Ensure the Written Exposure Control Plan has been created, communicated to all site personnel, and implemented effectively.
- Conduct frequent inspections of the job sites, materials, equipment and processes and having the authority to initiate prompt corrective actions when necessary.

The competent person for each job site will conduct a silica exposure hazard assessment and generate a *site specific* **Written Exposure Control Plan** prior to the commencement of work.

The Competent Person for silica on this jobsite(s) is Mr. Ray Lagesse, Project Supervisor.

### Sub-tier Activities

Subcontractor, Vendor and other sub-tier activities are expected to comply with the requirements of this program. Subcontractors who provide services/perform operations that generate airborne silica dust are required to provide HART Engineering Corporation/Ray Lagesse with their silica exposure control plan prior to the commencement of work.

## SPECIFIED EXPOSURE CONTROL METHODS

**Note: This section will be modified for each jobsite according to site-specific conditions and the tasks being performed.**

### OSHA Table 1

Whenever applicable, HART team members will perform silica dust generating activities in compliance with OSHA Silica Table 1. Supervisors will ensure each employee under their supervision and engaged in a task identified in Table 1 implements the engineering controls according to manufacturer specifications, complies with work practice control methods and uses respiratory protection when specified.

The table below identifies specific operations and tasks that will be performed using Table 1 and how we are going to protect workers.

Construction Task or Equipment Operation	Engineering and Work Practice Control Methods	Required Respiratory Protection*	
		≤ 4 hours/shift	>4 hours/shift
Stationary masonry saws - Cutting concrete block with a Masonry Station	<ul style="list-style-type: none"> <li>• Use saw equipped with integrated water delivery system that continuously feeds water to the blade</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> </ul>	None	None
Handheld power saws (any blade diameter) <u>when used outdoors</u> - Cutting of concrete, asphalt, masonry block, sheetrock, gypsum fiber roof board, or any other product containing quartz	<ul style="list-style-type: none"> <li>• Use saw equipped with integrated water delivery system that continuously feeds water to the blade</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> </ul>	None	APF 10
Handheld power saws (any blade diameter) <u>when used indoors or in an enclosed area</u> - Cutting of concrete, asphalt, masonry block, sheetrock, gypsum fiber roof board, or any other product containing quartz	<ul style="list-style-type: none"> <li>• Use saw equipped with integrated water delivery system that continuously feeds water to the blade</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> </ul>	APF 10	APF 10

<p><b>Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less).</b></p>	<p>FOR TASKS PERFORMED OUTDOORS ONLY:</p> <ul style="list-style-type: none"> <li>• Use saw equipped with commercially available dust collection system</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> <li>• Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency</li> </ul>	<p>None</p>	<p>None</p>
<p><b>Concrete coring and drilling operations with rig-mounted core saws or drills</b></p>	<ul style="list-style-type: none"> <li>• Use tool equipped with integrated water delivery system that supplies water to cutting surface</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> </ul>	<p>None</p>	<p>None</p>
<p><b>Concrete coring and drilling operations with handheld and stand-mounted drills (including impact and rotary hammer drills)</b></p>	<ul style="list-style-type: none"> <li>• Use drill equipped with commercially available shroud or cowling with dust collection system</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> <li>• Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism</li> <li>• Use a HEPA-filtered vacuum when cleaning holes</li> </ul>	<p>None</p>	<p>None</p>
<p><b>Jackhammers and handheld powered chipping tools <u>when used outdoors</u></b></p>	<ul style="list-style-type: none"> <li>• Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Use tool equipped with commercially available shroud and dust collection system</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust</li> </ul>	<p>None</p>	<p>APF 10</p>

	<p>emissions</p> <ul style="list-style-type: none"> <li>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism</li> </ul>		
<p><b>Jackhammers and handheld powered chipping tools <u>when used indoors or in an enclosed area</u></b></p>	<ul style="list-style-type: none"> <li>Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Use tool equipped with commercially available shroud and dust collection system</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> <li>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism</li> </ul>	APF 10	APF 10
<p><b>Finishing of concrete using handheld grinders for mortar removal (i.e., tuckpointing)</b></p>	<ul style="list-style-type: none"> <li>Use grinder equipped with commercially available shroud and dust collection system</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> <li>Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism</li> </ul>	APF 10	APF 25
<p><b>Handheld grinders for uses other than mortar removal for tasks performed (i.e., concrete stripping and finishing) <u>outdoors only</u></b></p>	<ul style="list-style-type: none"> <li>Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> </ul> <p>OR</p>	None	None

	<ul style="list-style-type: none"> <li>• Use grinder equipped with commercially available shroud and dust collection system</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> <li>• Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism</li> </ul>		
<p><b>Handheld grinders for uses other than mortar removal (i.e., concrete stripping and finishing) <u>when used indoors or in an enclosed area</u></b></p>	<ul style="list-style-type: none"> <li>• Use grinder equipped with commercially available shroud and dust collection system</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> <li>• Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism</li> </ul>	None	APF 10
<p><b>“Bush Hammering” and other walk-behind milling machines and floor grinders</b></p>	<ul style="list-style-type: none"> <li>• Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Use machine equipped with dust collection system recommended by the manufacturer</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions</li> <li>• Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater</li> </ul>	None	None

	<p>efficiency and a filter-cleaning mechanism. When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes</p>		
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\*Where an employee performs more than one task included in Table 1 during the course of a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.

HART seldom performs work that requires our employees to be in an enclosed cab or booth but in circumstances where this occurs, HART will ensure the enclosed cab or booth:

- Is maintained as free as practicable from settled dust
- Has door seals and closing mechanisms that work properly
- Has gaskets and seals that are in good condition and working properly
- Is under positive pressure maintained through continuous delivery of fresh air
- Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 µm range (e.g., MERV-16 or better)
- Has heating and cooling capabilities

***Alternative Exposure Control Methods***

For silica generating activities not listed in OSHA Table 1, or where the controls described in Table 1 cannot fully and properly be implemented, HART will assess the exposure of each employee who is or may reasonably be expected to be exposed to silica at or above the AL in accordance with either the Performance Option or the Scheduled Monitoring Option described below. Potential silica exposure levels and silica controls for tasks not covered by Table 1 will be determined by one or a combination of the following:

- Sampling: Personal sampling and air monitoring data, when required, will be obtained by trained/competent/certified technicians from the following labs and will be attached to the site-specific Exposure Control Plan

- Objective data: For tasks where objective data was obtained, the objective data will be attached to the site specific Exposure Control Plan. Objective data may be obtained from equipment manufacturers, tool manufacturers and other industry sources.
- Controlling Silica Exposures in Construction. Occupational Safety and Health Administration. U.S. Department of Labor. OSHA 3362-05. 2009
- 1926.1153 Respirable Crystalline Silica Table 1: Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica

Performance Option – HART will assess the 8-hour TWA exposure for each employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to silica.

- For employees exposed above the PEL, engineering and work practice controls will be implemented to ensure that the employee exposure is below the PEL
- When engineering and work practice controls cannot be lowered below the PEL, respirators will be used to ensure protection below the PEL

#### Scheduled Monitoring Option

- HART will perform initial monitoring to assess the 8-hour TWA exposure for each employee on the basis of one or more personal breathing zone air samples that reflect the exposures of employees on each shift, for each job classification and in each work area. Where several employees perform the same tasks on the same shift and in the same work area, HART will plan to monitor a representative fraction of these employees. When using representative monitoring, HART will sample the employee(s) who are expected to have the highest exposure to silica
- If initial monitoring indicates that employee exposures are below the AL, HART will discontinue monitoring for those employees whose exposures are represented by such monitoring
- Where the most recent exposure monitoring indicates that employee exposures are between the AL and the PEL ( $25 \mu\text{g}/\text{m}^3$ -  $50 \mu\text{g}/\text{m}^3$ ), HART will repeat such monitoring within six months of the most recent monitoring
- Where the most recent exposure monitoring indicates that employee exposures are above the PEL, HART will repeat such monitoring within three months of the most recent monitoring
- Where the most recent (non-initial) exposure monitoring indicates that employee exposures are below the AL, HART will repeat such monitoring within six months of the most recent monitoring until two consecutive measurements, taken seven or more days apart, are below the AL, at which time HART will discontinue monitoring for those employees whose exposures are represented by such monitoring, except when a reassessment is required.

- HART will reassess exposures whenever a change in the production, process, control equipment, personnel or work practices may reasonably be expected to result in new or additional exposures at or above the AL, or when HART has any reason to believe that new or additional exposures at or above the AL have occurred

HART will ensure that all silica samples taken to satisfy the monitoring requirements of this program and OSHA are collected by a qualified individual (i.e., a Certified Industrial Hygienist) and the samples are evaluated by a qualified laboratory (i.e., accredited to ANS/ISO/IEC Standard 17025:2005 with respect to crystalline silica analyses by a body that is compliant with ISO/IEC Standard 17011:2004 for implementation of quality assessment programs).

Within five working days after completing an exposure assessment, HART will individually notify each affected employee in writing of the results of that assessment or post the results in an appropriate location accessible to all affected employees. Whenever an exposure assessment indicates that employee exposure is above the PEL, HART will describe in the written notification the corrective action being taken to reduce employee exposure to or below the PEL.

Where air monitoring is performed, HART will provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to silica. When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, HART will provide the observer with protective clothing and equipment at no cost and shall ensure that the observer uses such clothing and equipment.

Once air monitoring has been performed, HART will determine its method of compliance based on the monitoring data and the hierarchy of controls. HART will use engineering and work practice controls to reduce and maintain employee exposure to silica to or below the PEL, unless HART can demonstrate that such controls are not feasible. Wherever such feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, HART will nonetheless use them to reduce employee exposure to the lowest feasible level and supplement them with the use of respiratory protection.

In addition to the requirements of this program, HART will comply with other OSHA standards, when applicable, such as 29 CFR 1926.57 (Ventilation), where abrasive blasting is conducted using crystalline silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain crystalline silica. Whenever possible, alternative, non-silica abrasives will be used.



**Specific operations and tasks that will be implemented using alternative control methods and how we are going to protect workers are listed below with descriptions of the controls and work practices that will be used:**

#### Drywall Finishing

- Use silica-free joint compound
- Wet sponge method, or
- Pole mounted sanders, or
- Vacuum assisted pole mounted sanders
- Use of a respirator with an APF of 10 unless air monitoring shows exposures below the PEL

#### Demolition of sheetrock and drywall by means not listed above

- Dust suppression misting system

#### Hand or power tool sanding of painted surfaces. Current latex paint products contain quartz and the painted substrate (sheet rock, concrete masonry block, concrete) contains quartz

- When feasible, use grinder equipped with commercially available shroud and dust collection system
- Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions
- Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism
- Workers will wear a respirator with an APF of 10 unless air monitoring shows exposures below the PEL

#### Prepping concrete by masonry rubbing or scraping of concrete flash

- Perform wet whenever feasible
- Set up work practices controlling for visible dust

#### Working with crushed stone

- Perform wet whenever feasible
- Set up work practices controlling for visible dust
- If there is a lot of dust generation, the area will be deemed as a restricted area, which will only allow access to certain workers that have been properly trained and have been provided the proper PPE (including respirators). Workers will wear a respirator with the appropriate APF, unless air monitoring shows exposures below the PEL

### **Excavation/Trenching work (within or around/nearby)**

- When performing excavation-related work the following best practices will be implemented:
- Excavation operations will be performed utilizing wet methods using a water spray or mist to suppress dust generation, especially during operations that may create a lot of dust, such as cutting or sawing silica-containing materials, jack hammering, impact drilling, using heavy equipment and demolishing structures
- Workers will be trained to stay upwind of or away from dust-generating activities, and in particular those involving silica materials like concrete, brick, tile, drywall, mortar, sand or stone

### ***Housekeeping***

HART does not allow dry sweeping or dry brushing where such activity could contribute to employee exposure to silica unless wet sweeping, HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure are not feasible.

HART does not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to employee exposure to silica unless the compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air.

Slurry that contains silica from using water controls will be contained when wet and disposed of per the Environmental Protection Agency (EPA), state or county regulations. Whenever possible, slurry generated by tools and equipment will be cleaned up before it dries using a wet vacuum. When emptying the vacuum, the slurry will be transferred into a plastic bag and placed inside a container for disposal. The container will be sealed to prevent the release of dust back into the work space. For larger operations, an alternative collection system will be implemented utilizing a special waste management collection system or receptacle (e.g., lowboy container or specialized dumpster).

### ***Disposal of Collected Silica Dust***

Work practices will be followed to minimize the amount of dust generated when emptying, cleaning and disposing of dust collected by tools and control devices. Controls and best practices to achieve this will be implemented (e.g., wet methods and LEV) and enforced by the onsite silica Competent Person. If dust is created above the PEL, respirators with the appropriate APF will be worn. All collected dust bags or containers will be sealed, labeled and disposed of properly.

### ***Restricted Areas***

Any area where Table 1 activities are occurring and areas where activities may expose the worker(s) above the OSHA AL will be restricted to only those workers performing silica-related tasks. All other workers will be restricted from the area by a combination of warning signs, barriers and the Competent Person.

### ***Respiratory Protection***

Where respiratory protection is required by this program, HART will provide each employee an appropriate respirator that complies with the requirements of the company's Respiratory Protection Program and the OSHA Respiratory Protection Standard (29 CFR 1910.134). Respirator use for Table 1 tasks will follow the requirements of Table 1. For non-Table 1 tasks, respirator use will be determined by air monitoring, objective data or until a determination has been made. Situations requiring respiratory protection include:

- Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls
- Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible
- During tasks for which an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL

Additionally, voluntary use respirators will be allowed in accordance with the company's Respiratory Protection Program and the OSHA Respiratory Protection Standard.

### ***Medical Surveillance***

In accordance with the OSHA Respirable Crystalline Silica Standard for Construction (29 CFR 1926.1153), medical exams will be made available to any worker who is expected to be required (by Table 1, air monitoring or any other non-voluntary reason) to wear a respirator for 30 or more days due to silica exposure during the coming year, unless they provide proof they have had a silica exam in the past three years. This medical surveillance will be performed by a Physician or other licensed health care professional (PLHCP) and provided at no cost to the employee at a reasonable time and place.

HART will make available an initial (baseline) medical examination within 30 days after initial assignment, unless the employee has received a medical examination that meets the requirements of the OSHA Respirable Crystalline Silica Standard for Construction (29 CFR 1926.1153) within the last three years. The examination shall consist of:

- A medical and work history, with emphasis on past, present and anticipated exposure to silica dust and other agents affecting the respiratory system in addition to any history of

respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing), history of tuberculosis and smoking status and history

- A physical examination with special emphasis on the respiratory system
- A chest X-ray (a single posteroanterior radiographic projection or radiograph of the chest at full inspiration recorded on either film [no less than 14 x 17 inches and no more than 16 x 17 inches] or digital radiography systems) interpreted and classified according to the International Labour Office (ILO) International Classification of Radiographs of Pneumoconiosis by a NIOSH-certified B Reader
- A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course
- Testing for latent tuberculosis infection
- Any other tests deemed appropriate by the PLHCP

HART will make available medical examinations that include the aforementioned procedures (except testing for latent tuberculosis infection) at least every three years. If recommended by the PLHCP, periodic examinations can be more frequently than every three years.

HART will ensure that the examining PLHCP is provided with:

- A copy of the OSHA Respirable Crystalline Silica for Construction Standard (29 CFR 1926.1153)
- A description of the employee's former, current and anticipated duties related to silica exposures
- A description of the employee's former, current and anticipated exposure levels to silica
- A description of any PPE used or to be used by the employee (e.g., the type of respirator (APF) used and when they will use a respirator. For example, an N95 respirator (APF 10), 3 times a week for 3 hours
- Any previous medical records currently under our control

*HART will ensure that the PLHCP explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of each medical examination performed. The written report will contain:*

- A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to silica and any medical conditions that require further evaluation or treatment
- Any recommended limitations on the employee's use of respirators
- Any recommended limitations on the employee's exposure to silica

- A statement that the employee should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader or if referral to a Specialist is otherwise deemed appropriate by the PLHCP

*HART will also obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion shall contain only the following in order to protect the employee's privacy:*

- The date of the examination
- A statement that the examination has met the requirements of the OSHA Respirable Crystalline Silica Standard for Construction (29 CFR 1926.1153)
- Any recommended limitations on the employee's use of respirators

*If the employee provides written authorization, the written opinion shall also contain either or both of the following:*

- Any recommended limitations on the employee's exposure to silica
- A statement that the employee should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader or if referral to a Specialist is otherwise deemed appropriate by the PLHCP

*If the PLHCP's written medical opinion indicates that an employee should be examined by a Specialist, HART will make available a medical examination by a Specialist within 30 days after receiving the PLHCP's written opinion. HART will ensure that the examining Specialist is provided with all of the information that the employer is obligated to provide to the PLHCP. HART will ensure that the Specialist explains to the employee the results of the medical examination and provides each employee with a written medical report within 30 days of the examination. The written report will contain:*

- A statement indicating the results of the medical examination, including any medical condition(s) that would place the employee at increased risk of material impairment to health from exposure to silica and any medical conditions that require further evaluation or treatment
- Any recommended limitations on the employee's use of respirators
- Any recommended limitations on the employee's exposure to respirable crystalline silica

*In addition, HART will obtain a written opinion from the Specialist within 30 days of the medical examination. The written opinion shall contain the following:*

- The date of the examination
- Any recommended limitations on the employee's use of respirators
- If the employee provides written authorization, the written opinion shall also contain any recommended limitations on the employee's exposure to silica

## **Training**

Prior to beginning work, all workers potentially exposed to silica will be trained on:

- The potential health effects of silica
- Tasks that may result in silica exposure
- Controls, work practices and respirators that will be used to reduce silica exposures
- Housekeeping requirements
- Restricted area access limitations
- The OSHA Respirable Crystalline Silica Standard for Construction (29 CFR 1926.1153)
- The onsite silica Competent Person
- Availability of medical screening every three years
- Availability of our records of their silica exposure levels and medical records

A copy of this written program will be made available to all employees and OSHA officials, as necessary, at no charge. Refresher training will occur through toolbox talks and JHAs. Silica hazards will also be included in HART's Hazard Communication Program established to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200).

### ***Recordkeeping***

HART will make and maintain an accurate record of all exposure measurements taken to assess employee exposure to silica. This record will include at least the following information:

- The date of measurement for each sample taken
- The task monitored
- Sampling and analytical methods used
- Number, duration and results of samples taken
- Identity of the laboratory that performed the analysis
- Type of personal protective equipment (PPE), such as respirators, worn by the employees monitored
- Name, social security number and job classification of all employees represented by the monitoring, indicating which employees were actually monitored

HART will ensure that exposure records are maintained and made available in accordance with 29 CFR 1910.1020. Exposure records will be kept for at least 30 years.

HART will make and maintain an accurate record of all objective data relied upon to comply with the requirements of the OSHA Respirable Crystalline Silica Standard for Construction (29 CFR 1926.1153). This record shall include at least the following information:

- The silica-containing material in question
  - The source of the objective data
  - The testing protocol and results of testing
- 
- A description of the process, task or activity on which the objective data were based

- Other data relevant to the process, task, activity, material or exposures on which the objective data were based

HART will ensure that objective data are maintained and made available in accordance with 29 CFR 1910.1020. Objective data records will be kept for at least 30 years.

HART will make and maintain an accurate record for each employee enrolled in the Medical Surveillance portion of this program. The record shall include the following information about the employee:

- Name and social security number
- A copy of the PLHCP's and/or Specialist's written medical opinions
- A copy of the information provided to the PLHCPs and Specialists

HART will ensure that medical records are maintained and made available in accordance with 29 CFR 1910.1020. Medical records will be kept under lock and key for at least the duration of employment plus 30 years. It is necessary to keep these records for extended periods because silica-related diseases such as cancer often cannot be detected until several decades after exposure. However, if an employee works for an employer for less than one year, the employer does not have to keep the medical records after employment ends, as long as the employer gives those records to the employee.

### ***Program Evaluation***

This program will be reviewed and evaluated on an annual basis unless changes to operations, the OSHA Respirable Crystalline Silica Standard for Construction (29 CFR 1926.1153) or another applicable OSHA Standard require an immediate re-validation of this program.



## Sign-In Sheet

TOPIC:

JHA's, Training, Toolbox Talks, Stand Downs

DATE:

Client/ Job: Taunton WWTP

PRINT NAME

SIGN NAME

1. \_\_\_\_\_

2. \_\_\_\_\_

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14. \_\_\_\_\_

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15. \_\_\_\_\_

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# **SECTION 3**

# **INCIDENT INVESTIGATION AND REPORTING**

**INCIDENT INVESTIGATION FOLLOW-UP**

All occurrences shall be investigated thoroughly. The proper investigation of an “incident” or “near miss”

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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

will substantially reduce the chance of a reoccurrence and the possibility of an injury or an additional insurance claim. Do not limit investigations only to bodily injury (Workmen's Compensation) incidents. An incident is any unwanted, unplanned event that interrupts the normal flow of scheduled activity. Investigated properly, the cause can be determined, corrected, and a reoccurrence eliminated.

Incident investigation records should not be concerned with the fixing of blame for an incident but with determining the root causes and contributive factors of an incident. It is the elimination of the causes and sub-causes of an incident that will lead to the prevention of future occurrences.

#### **A. INCIDENT INVESTIGATION**

The Project Superintendent, Designated Site Safety Competent Person and subcontractor foremen shall investigate and provide a written report of all incidents.

1. Follow the emergency procedure until the incident situation is stabilized.
2. Investigate the incident. Find out WHO, WHAT, WHEN, WHERE, and HOW.
3. Draw diagrams, mark-up drawings and take photographs of the incident scene. (Use a camcorder if necessary.)
4. Record status of construction at the scene at time of incident. Indicate what work was in place and what work was going on.
5. Determine how many subcontractors were working in the area, with how many workers each and what activity they were performing.
6. Identify witnesses. Record their names and employers. Interview them promptly and never in a group. Reassure them of the investigation's purpose (to find the cause and prevent it from happening again). Get their version without interruption then summarize your understanding of what the witness related to you. Ask them to sign a statement of description and cause.
7. Obtain copies of reports by others (police, fire department, subcontractors, doctors, etc.)
8. Describe any corrective action taken to prevent reoccurrence.
9. Provide written report as described below.

#### **B. INCIDENT REPORTING**

1. Any injury, from a minor type requiring a visit to a medical facility for treatment to a major type requiring transport to a hospital by a rescue vehicle, must be reported on

HART's Incident Investigation Report form.

2. Any property damage incident, whether project property or non-project property, must also be reported on HART's Incident Investigation Report Form.
3. Verbally notify the HART Project Safety Manager of all bodily injury incidents and/or damage immediately upon occurrence.
4. Submit written investigation reports to the HART Project Manager within 24 hours of the incident. Maintain a copy on file at the jobsite.
5. Any automobile/truck incident must be verbally reported to the HART Project Manager immediately following the occurrence.
6. Any instances of fire, theft or vandalism shall be verbally reported to the HART Project Manager immediately following the occurrence or upon discovery.

#### **C. PROCEDURE IF HART EMPLOYEE IS INJURED**

1. Immediately notify the home office (Corporate Safety Director) as required by HART's documented Incident/Accident Reporting procedure. The Corporate office will, in turn, contact the appropriate Insurance/Workmen's Compensation carrier. Next, begin your own investigation and fill out HART's Incident Investigation Report Form.
2. The injured employee's immediate supervisor must complete the "Supervisor's First Report of Injury" form. A copy of the standard form is included within the Safety Tool Box Talks binder that has been provided to all HART supervisors (foremen and superintendents). The 'Supervisor's First Report of Injury' must be immediately forwarded to the Corporate Office.
3. Send the copy of the completed 'Supervisor's First Report of Injury' form to the HART Corporate Safety Director at the HART Corporate Office and attach to it the original HART Investigation Report Form along with any other pertinent information.

#### **D. PROCEDURE IF SUBCONTRACTOR EMPLOYEE IS INJURED**

1. Institute the project's established Emergency Procedure.
2. HART's Project Superintendent, Designated On-Site Safety Representative and/or Safety Competent Person must be verbally notified by the subcontractor's foreman immediately that an incident has taken place and that one or more of his employees has been injured.
3. Notify the Corporate office by telephone that an incident took place. Next, begin your own investigation and complete HART's 'Incident Investigation Report Form.'
4. It is the responsibility of the Subcontractor's Foreman or Management to process the "Supervisor's First Report of Injury" Form. The Subcontractor is obligated to provide a copy of the completed form to HART's Project Superintendent, the Jobsite Safety Manager within 24 hours of the incident.
5. Obtain same as soon as possible and attach to it HART's Incident Investigation Report

Form and any other pertinent information; then submit all items to the main office.

**E. PROCEDURE IF A MEMBER OF THE GENERAL PUBLIC IS INJURED**

1. Institute emergency procedures (ex. secure area, care for injured, notify Emergency Rescue Services, etc;).
2. Coordinate and cooperate with police, fire, rescue and other public officials having jurisdiction in any way.
3. Notify the Corporate Safety Director by telephone that an incident involving a member of the general public has taken place and then begin an immediate investigation.
4. Complete HART's Incident Investigation Report Form and submit this, and any other pertinent information, to the main office.
5. Obtain names and addresses of all injured people and witnesses.

**F. INCIDENTS CAUSING PROPERTY DAMAGE TO PROJECT PROPERTY AND/OR NON-PROJECT PROPERTY**

1. Institute immediately any emergency procedures required to make damaged property stable and safe and to prevent further loss.
2. Notify the HART Corporate office.
3. Complete HART Incident Investigation Report Form and submit this along any other pertinent information to the main office.

**G. INCIDENT RECORDKEEPING**

1. Federal OSHA laws require incidents and illnesses of Company employees to be summarized and submitted in January of each year and posted in the project site offices each February - May (OSHA 300A Summary). Failure to post same could result in our being fined by OSHA.  
  
Some State laws require annual reports (OSHA 300A Form) summarizing totals from OSHA-300 to be submitted to the State Department of Labor each February.
2. The information required is compiled from Company Employer's First Report of Injury Forms and Company Incident Reports.
3. Project Manager/Jobsite Safety Representative/Competent Person shall maintain a file for Safety/Incident Reports on the jobsite.
4. OSHA compliance officers may request to review jobsite safety files during an OSHA inspection. OSHA-300, 300A and 301 records are on file at the corporate office.

**ACCIDENT/INCIDENT INVESTIGATION REPORT**

Report No. \_\_\_\_\_

Site: \_\_\_\_\_

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

**I. GENERAL INFORMATION**

Date/time of accident/incident: \_\_\_\_\_ Date/time reported: \_\_\_\_\_

HART Employee      Subcontractor Employee      Other/list:  
Involved employee's name: \_\_\_\_\_  
Involved employee's Company/Subcontractor's name: \_\_\_\_\_  
Length of employment with Company/Subcontractor : \_\_\_\_\_

**II. TYPE OF EVENT**

Near miss      Injury      Illness      Cut by      Struck by      Caught in/between  
Shocked by      Energy release      First aid      Part of body \_\_\_\_\_      Fatality  
Lost time: \_\_\_\_\_ days      Property damage      Equipment damage      Act of God  
Other: \_\_\_\_\_      Transported by ambulance/rescue/POV  
Hospital/Clinic: Name & Address \_\_\_\_\_

**III. DESCRIPTION OF EVENT (Who, what, where, when, why, how, equipment/tool)**

\_\_\_\_\_  
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**IV. IMMEDIATE RESPONSE (What was done, by whom, how it was done)**

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

**V. STATEMENT OF EMPLOYEE INVOLVED (Use additional sheets if necessary)**

Name: \_\_\_\_\_ Telephone: \_\_\_\_\_  
Home Address: \_\_\_\_\_  
Company: \_\_\_\_\_ Position/Title: \_\_\_\_\_  
Statement: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_







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VIII. ANALYSIS

Environmental conditions: \_\_\_\_\_

Primary elements: \_\_\_\_\_

Secondary elements: \_\_\_\_\_

Additional factors: \_\_\_\_\_

Comments/Observations:

IX. PHOTOGRAPHS: Yes (If Yes, attach) No ♦ SKETCHES: Yes (If Yes, attach) No

**PHOTOGRAPHS**

X. Witness Statement

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

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

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

\_\_\_\_\_

Telephone: \_\_\_\_\_

Company: \_\_\_\_\_

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

The following narrative is true to the best of my recollection:

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



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By whom: \_\_\_\_\_ Deadline: \_\_\_\_\_

Long term action: \_\_\_\_\_

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By whom: \_\_\_\_\_ Deadline: \_\_\_\_\_

<b>XII. SIGNATURES</b>
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Investigator: \_\_\_\_\_ Title: \_\_\_\_\_

Safety name: \_\_\_\_\_ Title: \_\_\_\_\_

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

XIV. Distribution	Project Manager Vice President	Jobsite Safety File HC's CEO	Corporate Safety Director Corporate Safety File
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**SUPERVISOR'S INCIDENT/INJURY/ILLNESS INVESTIGATION REPORT**

COMPANY	PROJECT/AREA	
SUPERVISOR	DATE	TIME
NAME		
INJURY DESCRIPTION		
CLASSIFICATION		
PROGNOSIS		
MEDICAL HISTORY		
SERVICE	AGE	
COMPANY _____ OTHER _____		
EQUIPMENT/PROPERTY DAMAGE		
◆ NONE		

DESCRIPTION OF INCIDENT	
INVESTIGATION RESULTS	
WITNESSES	COULD INJURY HAVE BEEN PREVENTED? YES NO
JOB LINE UP	
PROCEDURE VIOLATION	
DEFECTIVE EQUIPMENT/MATERIAL	
DISCIPLINE	
SUBSTANCE ABUSE TEST	
WHAT MANAGEMENT CONTROL OF PROCESS WEAKNESS ALLOWED THIS INCIDENT TO OCCUR AND WHAT IS GOING TO BE DONE TO IDENTIFY AND CORRECT THIS WEAKNESS.	
RECOMMENDATIONS	

<b>EMPLOYEE'S REPORT OF OCCUPATIONAL ILLNESS/INJURY</b>					
<b>TO BE COMPLETED BY EMPLOYEE</b>					
EMPLOYEE'S NAME		BRASS NUMBER	DATE OF INJURY	TIME OF INJURY	
SOCIAL SECURITY NUMBER		MARITAL STATUS	SEX	AGE	D.O.B.
Address	STREET	APT. #	CITY	STATE	ZIP CODE
TELEPHONE NUMBER		NUMBERS OF DEPENDENTS		CRAFT	
EMPLOYER	LENGTH OF EMPLOYMENT		HOURLY PAY	FOREMAN	
Years in trade			D.O.H.		
HOW INJURY OCCURRED?					
HOW COULD INJURY/ILLNESS HAVE BEEN PREVENTED?					

SIGNATURE			DATE	
<b>TO BE COMPLETED BY FIRST AID ATTENDANT</b>				
DESCRIPTION OF ILLNESS/INJURY				
TYPE OF TREATMENT	FIRST AID	DOCTOR	HOSPITAL	NONE
DESCRIPTION OF FIRST AID TREATMENT (If doctor or hospital include names and location)				
ANALYSIS				
NO. NATURE OF INJURY	NO. BODY PART	NO. CAUSE/INJURY	UNSAFE COND	UNSAFE ACT
DISABLING INJURY/ILLNESS		DURATION OF DISABILITY	DATE	SIGNATURE
YES	NO			

**WORKERS COMPENSATION**      **DATE** \_\_\_\_\_

<b>INSURANCE INFORMATION</b>				
Carrier (insurance company)			Policy number	
<b>EMPLOYER INFORMATION</b>				
Employer name				
Federal Tax ID Number			Location Number	
Address		City	State	Zip
Phone number			Fax number	
Preparer's name First			Last	
Preparer's title			Phone number	
Physical location (if different)				
Address		City	State	Zip
<b>EMPLOYEE INFORMATION</b>				
Employee's name		First	Middle	Last
Address		City	State	Zip
Employee ID number		SSN	Phone number	



Date of birth	Marital Status	Sex Female Male	Number of Dependents	<u>Under 18</u>	<u>Other</u>
Department	Date of Hire	State of Hire			
Wage Rate \$	Per	Average hours per day	Average days per week		
Paid in full for date of injury yes no		Did salary continue yes no			
<b>INCIDENT INFORMATION</b>					
Address where incident occurred		City	State	Zip	
Filing state	On employer's premises? Yes No				
Did employee lose one or more days of work? Yes No	Injury Date	Time of injury	AM	PM	
Time work began on AM	Day of injury PM	If lost time, last day worked	Date returned to work		
Date employer was notified	Name of person notified				
Fatality? Yes No	If yes, date of death				
Were safeguards or safety equipment provided? Yes No		If so, was employee using them? Yes No			
Type of injury		Part of body			
Describe what happened, in detail (employee's activity, objects involved, how injury occurred, etc.)					

Workers' Compensation Report (continued)

<b>WITNESSES</b>							
Witness name			Phone number				
Witness name			Phone number				
<b>MEDICAL TREATMENT</b>							
Did employee go to Clinic/Physician		Name		Phone number			
Address		City	State	Zip			
...Hospital? Name		Phone number					
Address		City	State	Zip			
Type of treatment	ER	First Aid	Hospital	In-House	None	Unknown	Outpatient
Any reason to believe this was not work related?				Yes	No	Unknown	
<b>STATE SPECIFIC QUESTIONS</b>							



## **SECTION 4**

# **RESPONSIBILITIES FOR SAFETY & HEALTH**



## MANAGEMENT RESPONSIBILITIES

The Company Management is committed to a safety program for an effective safety performance on the job and hereby provides the following directives:

1. Impress upon all supervisory personnel the responsibility and accountability of each individual to maintain a safe place to work.
2. The Vice President-Construction, Operations and/or Regional Managers will supervise and assist in the management of the Safety program for the jobs in which they oversee.
3. The Vice President-Construction, shall review all HART, Insurance Co. and Owner Project Safety Inspection reports and consult with Project Managers and Project Superintendents for adequate responses to the recommendations made.
4. Top management will maintain an interest and participate in the safety program by checking on safety when visiting a jobsite and being available for discussion of problems concerning safety.
5. The Purchasing Department will consider subcontractor Safety performance and contractually require that the subcontractors abide by the Company's Safety Program. The Vice President-Construction and/or Regional and Operations Managers will assist the Corporate Safety Manager in requiring this of all subcontractors and vendors on HART projects.
6. The staff position of Corporate Safety Director will support the Regional Management, Project Management and Field management of issues related to Safety, Health & Environmental.
7. Assist site management/supervision in ensuring that employees and subcontractors are following the safety rules and requirements of OSHA, client and HART Engineering.

## PROJECT MANAGER'S RESPONSIBILITIES

It will be the Project Manager's responsibility to plan, direct and control the safety program at his assigned jobsites. It is towards this end that the following responsibilities are directed:

1. Ensure only Safety-qualified subcontractors are selected.
2. Monitor and assist the Project Superintendent who is designated as the Company jobsite Safety Coordinator. Ensure staff and subs are aligned to HART Engineering safety goals.
3. Maintain appropriate rules, regulations and codes at the jobsite. Distribute relevant reports, data and forms pertinent to the safety program.
4. Shall be responsible for ensuring the investigation of all serious accidents/injuries on the jobsite and for making sure that completely filled out accident reports are sent to the HART Engineering Safety Manager in 24 hours. Lost time accidents to be e-mailed immediately to HART Engineering Corporate Safety Director.
5. Participate in advance safety planning for all activities through the use of pre-bid meeting, scheduling, pre-task meetings and weekly coordination meetings, including Project Superintendents, Subcontractors and Project Safety Manager.
6. Participate in Safety Audits periodically and distribute to all subcontractors involved copies of jobsite Safety inspections for their review and comments and **hold subcontractors accountable** for prompt correction and performance.
7. Weekly subcontractor meetings shall include discussion of safety requirements as it applies to current and planned construction activities.
8. Periodically monitor all aspects of the program for effectiveness, necessary assistance to the field personnel including maintaining an interested participation in safety and compliance.
9. Promote and schedule Safety Leadership Training, OSHA 10-Hour Training and other HART Engineering Safety Training courses.
10. Shall ensure that vendors or subcontractors have sent in required insurance certificates to the Corporate Insurance Manager before allowing them to begin work on the jobsite.
11. Set a good Safety example for HART Engineering staff by promoting and encouraging cooperation with Safety Rules and communication of Safety concerns.
12. Set Project Safety performance goals and regularly monitor achievement of same.

## **WORKSITE SUPERVISOR'S RESPONSIBILITIES**

(Superintendents, Foremen & Crew Leaders)

The Project Superintendent is the designated Company Safety Coordinator or 'Competent Person' on the jobsite and is responsible for the implementation and the enforcement of the company's safety program. If a separate and distinct Project Safety Coordinator is assigned to the jobsite, that person shall assist the Superintendent with the jobsite Safety Program. The addition of a designated/dedicated safety resource to a project does not relieve the Project Foreman/Superintendent of their safety responsibilities at the worksite.

The duties and responsibilities of project/worksite supervisors shall include, but are not limited to, the following:

1. Plan and require that all work be done in compliance with HART Engineering Project Safety Program and the Owner's Safety Program, including all applicable local, state and federal regulations.
2. By example, impress upon all supervisory and craft personnel a responsibility and accountability of each individual to maintain a safe workplace and work in a safe manner.
3. Shall be responsible to conduct weekly Safety assessments and for keeping a written record of same and also for making recommendations of any corrective action to be taken on safety violations noted. The notice of violation can be given verbally then confirmed in writing. Copies of inspections or violations should be sent to Project Management, and HART Engineering Safety Manager to solicit contractor Safety compliance. These violations can also be noted in the daily job reports and/or in the bound Superintendent's diary.
1. Maintain a job file for all necessary documentation at the jobsite (i.e. MSDS Sheets, Jobsite Safety Inspection Reports, OSHA Inspection Reports, Toolbox Safety Meetings, posters, notices, accident report log, accident reports and company directives, instructions and educational material).
5. Maintain copies of all manuals and materials including HART Engineering Safety Program, the OSHA Manual and the State Safety Code of the state you are working in that are needed to carry out the Safety Program at your jobsite.
6. Conduct weekly "toolbox" safety meetings on the first work day of each week, with all foremen recording same on the Weekly Safety Meeting Form. The superintendent shall then forward copies to the main office before the close of that business day.
7. Ensure availability and use of all necessary personal protective equipment and first aid

materials.

8. Ensure the security of the jobsite at all times.
9. See that all accident victims are promptly cared for and that the accident is promptly investigated and reported properly to the HART Engineering Corporate Safety Director. Root causes shall be identified and corrective actions shall be implemented for all accidents.
10. Notify the HART Engineering Corporate Safety Director of all bodily injury accidents and/or damage to property immediately upon their occurrence. Immediately advise the Corporate Safety Director immediately of any potential lost time injuries.
11. The Superintendent shall accompany the Corporate Safety Director and any and all outside agencies making an inspection of the project (Fire Department, OSHA Compliance Officer, Owner Safety Representatives, etc.) and ensure that immediate responses to any recommendations are made.
12. Shall insist on each visitor in any capacity properly identifying himself and his name be duly recorded in the daily job report and/or the daily log book.
13. Before starting any OSHA or state Safety inspection, notify the Project Manager and Safety Director and request their participation and support in the walk-through.
14. Shall require from any outside Safety or Insurance agency making an inspection of the project a report stating violations and/or recommendations before leaving the premises. A copy of this report shall be provided to HART Safety Manager.
15. Shall write a brief report commenting on the outside agencies' above-referenced report and distribute as above.
16. Obtain a copy of, and periodically participate in, all subcontractors' weekly toolbox safety meetings signed by all attendees.
17. Shall correspond with HART Engineering's Corporate Safety Director on all important matters regarding job safety.
18. Become First Aid - CPR certified/trained (strongly recommended).
19. Inform project management of problems that are beyond the Superintendent's authority.
20. Delegate details to responsible company employees under your supervision.
21. Set a good example for all employees by following project and Company Safety requirements and by actively participating and promoting Safety Program initiatives.



22. Ensure that each new employee, prior to beginning work be given a Safety Orientation by HART Engineering's designated representative and sign-off attesting to the fact that he has been given the orientation.
23. Superintendent shall immediately correct all hazards that are identified in work area.
24. Post emergency phone numbers at all jobsite telephones and set-up emergency response procedures and providers at project start-up.
25. Post the HART Engineering Basic Safety Rules and Requirements" in a conspicuous place on your jobsite safety bulletin board.
26. Authorizes the necessary action to correct any substandard conditions that may exist on the jobsite.

## **SAFETY & ACCIDENT PREVENTION RESPONSIBILITIES GENERAL**

Project safety is a primary responsibility of all Contractor management and supervision on the project. The Contractor Project Safety Manager monitors all safety activities at the job sites and reports his findings to management through the Site Manager. The Safety Manager administers the project safety and fire-prevention programs. The project safety program is administered in accordance with HART Engineering's Accident Prevention Standards, Policies and Procedures Manuals.

### **A. SITE SAFETY MANAGER**

The Site Safety Manager is responsible for the following functional operations of the project safety programs:

- 1) Develop applicable safety standards for the project in accordance with HART Engineering's Accident Prevention Standards, government regulations, and Client-specific safety requirements.
- 2) Participate in work-site layouts to assure adequate work areas, traffic control, parking areas, lighting levels, receiving areas, etc. Assure that location of offices, shops, maintenance areas, medical, and sanitation facilities reflect safety considerations.
- 3) Promote safety on the project through indoctrination and orientation of project personnel.
- 4) With the project manager and supervision, review the work schedules as they are developed to be aware of the number of contractors and craft workers working in the various areas. Lend assistance by identifying hazards and implement supporting safety activities to minimize the risks to personnel.
- 5) Maintain surveillance of job-site working conditions and safety practices.
- 6) Establish personal protective-equipment requirements in accordance with the HART standard, client requirements and recommend requisitions for purchase.
- 7) Plan the site safety publicity program and order posters, visual aids, signs, etc.
- 8) Maintain liaison with HART Engineering Safety Manager, insurers, federal and state inspectors, and others in matters of safety.

- 9) Work with the project manager and supervision to maintain required safety records.
- 10) Maintain pertinent information (i.e. phone number, locations) of Emergency Response Services, physicians, and hospitals.

## **B. PRACTICES AND PROCEDURES**

- 1) Safety Standards and Orientation
  - a) The Site Safety Manager shall implement safety programs as part of an overall safety process to assure compliance with all applicable policies, procedures and standards.
  - b.) The Site Safety Manager will conduct weekly supervisors safety meetings with all foremen and supervisors to review safety statistics for the week and provide safety topics or training. All levels of supervision are expected to attend and participate in the meetings. Visual aids such as leaflets, safety posters, videos and slides, are used to create and maintain awareness and interest in the training programs.

Each foreman is responsible for conducting a 15-minute meeting every Monday morning before commencement of work. The foreman shall discuss safety topics discussed in the Supervisor's Safety Meeting held each week. Safety problems for the past week will be reviewed and suggestions are encouraged on ways to prevent recurrences. The foreman is responsible for issuing individual safety instructions to all crew members as applicable to work assignments. These instructions are reviewed and updated in the event work activities change.

- c.) Supervision will complete a Foremen's Tool Box Meeting Report each week, which will reflect the topics of discussion during the meeting and suggestions made by the crew to improve accident prevention on the project. Each member of the crew shall sign on acknowledging that they attended the Tool Box Meeting. The report will then be submitted to the Corporate Office for review no later than 12:00 noon on the same day.

## **C. SAFETY EQUIPMENT**

- 1) Employees are issued a hard hat and safety glasses with side shields meeting the requirements of ANSI Z87.1+. Dark lens safety glasses are not allowed in buildings with inadequate lighting. This equipment is required to be worn during working hours in all areas except offices or enclosed cabs of vehicles.
- 2) Employees are recommended to have safety shoes meeting the requirements of ANSI Standard Z-4 1.1-1967.

- 3) Approved safety equipment as required by the Federal and State Safety and Health Regulations is available at all times, and strict enforcement of its proper use is exercised by project supervision.
- 4) The Site Safety Manager recommends and approves all safety equipment prior to purchase.
- 5) All visitors must wear personal protective equipment (PPE) as required by HART Companies, identical to that specified for workers within the worksite.
- 6) Employees operating or assisting in the operation of table saws, side grinders, radial arm saws, drill presses, compressed air chipping or chiseling tools (guns), or any other tool that may cause material to fly, will wear full face shields in addition to safety glasses.
- 7) Employees working with or assisting in work handling molten materials or reactive chemicals will wear an appropriate full-face shield and monogoggles.
- 8) Metal hard hats are not permitted.
- 9) Hard hats will be worn with the bill of the hat forward at all times. This applies to ironworkers when actually connecting steel, riggers working with a load and Engineers while using instruments. Hard hats will not be altered in any way, such as drilling holes, bending, etc., that can reduce the protection it is designed to provide.

#### **D. HEARING CONSERVATION**

- 1) The criteria and requirements for occupational noise exposures are contained in 29 CFR **1926.52**. Employee's hearing will be protected in accordance with this procedure and accepted hearing conservation measures.
- 2) Supervision shall determine which job assignments could expose an employee to noise levels greater than 80 dBA, and 85 dBA/8-hour Time Weighted Average (TWA). A continuing, effective hearing conservation program will be provided for each employee exposed to noise levels of 80dBA or greater, regardless of situational or 8-hour TWA. The hearing conservation program will include:
  - a) Monitoring noise levels to identify work, areas or specific equipment, which exceed 80 dBA. Measurements will be performed using an ANSI Type II sound level meter, or equivalent, set on the A scale, slow response.
  - b) Implementing feasible engineering and administrative controls to reduce employee exposures to 80 dBA, or less.
  - c) Training on the effects of noise exposure and the proper use of earplugs

and earmuffs.

- d) Make provisions for and enforcement of the use of adequate earplugs or earmuffs for employees who work in areas exceeding 80 dBA.

**E. SAFETY HAZARDS**

- 1) The Site Safety Manager posts warning notices in the areas that are determined to be hazardous and enforce all special rules or instruction regarding safety in such areas. They notify HART Project Manager of any consistent disregard of hazard warnings or safety instructions.

**F. SAFETY INSPECTIONS**

- 1) The Contractor Site Safety Manager performs daily safety inspections of the site. Any infractions or poor safety practices noted by these inspections will be promptly corrected.
- 2) Designated supervisory personnel shall conduct documented daily inspections.

**SECTION 5**

**SITE SAFETY INSPECTIONS**

**AND**

**SAFETY MONITORING**

## **SAFETY MONITORING ACTIVITIES**

This section describes the method of conducting safety monitoring activities, responsibilities, and

reporting requirements.

#### **A. GENERAL**

- 1) Accident prevention is a primary responsibility of all levels of supervision and management. Each supervisor/manager should maximize initiative of safety-related communication training, motivation, and monitoring techniques.
- 2) The Site Manager is responsible for ensuring that all safety-monitoring activities are conducted on a regular basis.
- 3) The Site Safety Manager or designated on-site safety representative shall develop a weekly schedule of assessments to be conducted. The schedule should include the name of the supervisor, contractor or area to be assessed and the day and time of each assessment. Supervisory personnel shall assist in conducting assessments of their respective work activities and areas.
- 4.) A safety inspector and supervisor will conduct the Safety Assessment, record deficiencies, recommend corrective action and score the assessment accordingly.
- 5) The Site Manager will promptly investigate safety-related deficiencies and/or recommendations and corrective action taken as directed.
- 6) The Site Manager will receive copies of all Safety Assessments and take corrective action as directed.

#### **B. SAFETY ASSESSMENTS**

- 1) The HART Engineering Site Safety Manager or designated safety representative and Site Manager shall jointly conduct a complete assessment of work activities on a monthly basis.
- 2) HART Engineering Supervisors shall participate in or conduct assessments weekly of their respective work activities and areas. The assessments are to be documented on the Safety Self-Assessment Form.
- 1) Applicable categories will be assessed and rated to ensure compliance with HART Engineering Accident Prevention Standards, Client and Regulatory Agencies Safety Policies and Procedures.
- 4) The specific categories to be checked are as follows:
  - Personal protective equipment
  - Fire Protection
  - Tools/equipment
  - Procedure compliance
  - Housekeeping
  
  - Fall Protection
  - Scaffold and Ladders
  - Hoisting and Lifting Equipment
  - Excavations
  - Permits / Safety Task Assignment



Note: Categories may be amended or changed as required to reflect type of work performed.

- 5) Each deficiency/recommendation will be documented on the Safety Self-Assessment Form, noting the corrective action to be taken. The date of corrective action is to be noted in the far right hand column of the observation form.

#### **C. SCORING THE ASSESSMENT**

- 1) The individuals performing the audit should score the assessment. Each applicable category is rated from 0 to 10.
- 2) If there is a section or subsection that is not applicable, note it as such by spacing out the "Possible Points" section of each category.
- 3) Add the total possible points and the points awarded in each section. Enter the total of each in the last columns of the section.
- 4) Divide the total possible points into the total of points awarded to determine the score of the subsection. Enter the score in the right hand column of the subtotal line.
- 5) Each applicable subsections will be scored with the final score determined by dividing the total possible points of all sections into the total points awarded for all sections

#### **D. ASSESSMENT SCORES**

- 1) **Grade from 100% to 85%** - All corrections shall be made by the foreman. When corrections are made, the audit shall be sent to the manager or superintendent for verification and signing. The manager or superintendent shall direct the audit to the Safety department. The Safety department will file and record it in the database for tracking.
- 2) **Grade below 85%** - If an audit score is below 85% a meeting will be established for counseling with Project Management. During the meeting such items such as reasoning for the low score, problem areas, and safety of the employees will be mentioned. The audit will then follow the same path as above.
- 3) **Grade below 70%** - Immediate corrective measures shall be initiated until satisfactory compliance is obtained. In such cases of Imminent Danger situations work stoppage and Immediate Corrective Actions will be forthcoming. Additionally, a meeting of site management and safety personnel will be scheduled promptly to evaluate and assist in the implementation of prevention techniques.

#### **E. PROCEDURE**

- 1) Corporate Contractor Safety Representative
  - a. Conduct a complete assessment of work activities on a monthly basis.
  - b. Develop schedule of safety assessments by supervisory employees.

- c. Select supervisory employees on a weekly basis to assist in Safety Self-Assessments as scheduled.
  - d. Monitor assessment scores for trends that may develop. Scores are to be monitored using the Assessment Score Summary Program (Attachment B) or similar program.
- 2) Designated Supervisors
  - a. Assist in scheduled safety assessments.
  - b. Initiate corrective action for deficiencies noted. Follow up to ensure deficiencies are corrected.
- 3) Site Manager
  - a. Participate in the weekly overall project assessment.
  - b. Ensure that all safety-related deficiencies and recommendations are addressed promptly.
- 4) Corporate Safety Services
  - a. Review periodically safety-monitoring activities at all locations, assist with resolving questions, and take corrective action as required.
  - b. Conduct at a minimum of one Corporate Safety Assessment per year for each project.

**ATTACHMENT A: Safety Self-Assessment Program and Assessment Score Summary Program**



# **SECTION 6**

## **WORK PLANNING**

### **JOB HAZARD ANALYSIS**

#### **AND**

### **SAFETY TASK ASSIGNMENT**

**JOB HAZARD ANALYSIS / SAFETY TASK ASSIGNMENT**

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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

## **JOB HAZARD ANALYSIS**

(also known as Activity Hazard Analysis, Job Hazard Analysis or Task Hazard Analysis)

### **A. GENERAL**

Job Safety Analyses are a basic procedure for analyzing a scope of work's identified, known and predictable hazards, establishing abatement methods and assigning associated responsibilities to ensure risks are eliminated. JHA's must be developed with input and review by competent and experienced trades team members to ensure completeness and relevance with respects to ensure performance efficiency while effectively preventing operational risks. There are five basic steps involved in developing a JHA:

- 1) Define the Complete Scope of Work
- 2) Break Down the Scope of Work and Identify the
  - a. Definable Features of Work, or
  - b. Individual Work/Activity Tasks;
- 3) Identify the potential hazards and assessing the resulting risk
- 4) Determine how to eliminate/reducing the risk at the source, where possible; and
- 5) Develop and/or Recommend Controls to Eliminate the identified hazards;
  - a. Safe Work Practices,
  - b. Procedures
  - c. Governing/Controlling/Prevailing Standards

Once JHA's or other planning tools are developed by HART and/or Subcontractor Supervisory teams, they should be periodically reviewed to determine that if they are up-to-date, addressing known and predictable hazards and applicable prevailing standards.

### **B. PROCEDURE**

- 1) The JHA must be developed with input by personnel that regularly perform the definable feature of work, or task, in order that all typical work process hazards may be identified. The input from experienced trades team members is critical to the development of a complete JHA.
- 2) Prior to commencing any scope of work a JHA must be developed by the HART or HART's Subcontractor. The Project Supervisory and Leadership Team and the (Designated) Site Safety Representative must be provided with the details of the scope, the crafts and or contractors to perform the work, the area the work is to be performed and the estimated start date.
- 3) Subcontractors must review their related Scope of Work and identify all applicable Client, HART Engineering, State and Federal procedures / standards.
- 4) Subcontractors must complete a JHA, listing the hazards, abatement procedures and responsible individuals

- 5) The JHA will be submitted to HART Engineering by the Subcontractor for review and comments. A Pre-task Safety meeting will be scheduled with the Subcontractor and applicable HART Engineering and Client management and supervision responsible for the work activities. The Subcontractors' JHA(s) will be reviewed, with supervision responsible for implementing identified abatement measures.
- 6) A roundtable discussion will then be conducted utilizing the experience of all meeting attendees to identify any additional project-specific requirements and hazard(s) that may have been experienced before when performing similar work activities on this, or other, projects.
- 7) Abatement measures will be developed for any hazard(s) that are identified as a result of the round table discussion.
- 8) A copy of the completed JHA will be issued to HART Engineering and distributed to all supervisors involved in completing the scope of work.
- 9) The completed JHA should be reviewed on a weekly basis with all involved craft personnel. The JHAs contained within the plan will be used to assist the supervisors in developing daily Safety Task Assignment forms.
- 10) The JHA should be updated if there is a change in the work scope or performance methods.
- 11) The JHA should be periodically reviewed to determine if updating is required.

### **SAFETY TASK ASSIGNMENTS (also known as Safety Task Assessments)**

This procedure provides guidelines for all supervisors who assign work to employees. Additionally, it takes into consideration all aspects of the task to be performed with emphasis on safety.

#### **A. GENERAL**

- 1) Safety Task Assignment (STA) is showing or explaining to each employee the safety application that pertains to the job he/she is to do.
- 2) It is the responsibility of management down through foreman to give STA assignments to all employees, either individually or in a group before they actually begin any assigned task. The STA may only require a few words, but in many cases, it could require an actual demonstration of how the job can be done safely while pointing out any hazards that may be encountered in any task.
- 3) Supervisors can efficiently, and effectively, manage their daily activities by assuring that every employee thoroughly understands each STA given to them on every task that they are to complete.

#### **B. PROCEDURE**

- 1) Each foreman shall review the JHA applicable to the scope of work to be performed and must analyze each job or task for specific hazards before work

begins. This will enable them to give accurate instructions for each task that their team members will be engaged in during that work shift.

- 2) The magnitude of the task will generally determine the extent of the STA. Some tasks will require only a few words of an STA, while others may need to include a more detailed explanation or other preparation for the involved team members. All team members involved must be checked to ensure that they understand what they are expected to do to safely perform their task.
- 3) Each foreman is responsible for giving STAs every day for their group(s) of team members. The STA must include any specific hazard or conditions that the group may encounter, required safety equipment, and any other personal protective devices that are needed.
- 4) Each foreman will remind each team member to be alert to the identified and potential hazards that may be encountered during the course of their work activities. These team members know that they must report any hazard observed to their foreman (or other designated supervisor) for correction
  - *It is the responsibility of the team foreman (or other designated leader in the absence of a foreman) to initiate required preventative actions to the greatest degree necessary, to achieve abatement of the hazards - especially following notification of these hazards by their team members.*
- 5) The STA Roster must be posted near the work area for reference by the team members. This will enable team members and client personnel to review the various work plans during the course of the shift.
- 6) AT THE END OF THE SHIFT - Each team member will sign off on the 'Post Task Assignment' section of the STA form before to leaving the project or at the completion of task.
- 7) The STA roster must be turned in to the Project Supervisor at the end of each shift for review and inclusion in the project's Daily Report.

**ATTACHMENT A:** Safety Task Assignment Roster

**ATTACHMENT B:** Safety Task Assignment (STA)



<b>HART Engineering Attachment A</b>		<b>Safety Task Assignment Roster</b>
<b>FOREMAN</b>	<b>DATE</b>	<b>WORK AREA</b>

<b>Hazard</b>	<b>Employee</b>
Fall Protection	
Eye Protection	
Rigging	
Fire protection/Prevention	
Hand Tools	
Power Tools	
Electrical	
Hazardous Material	
Confined Space Program	
Scaffold Safety	
Respirators	
Cranes	
Lock & Tag Procedures	
Heat Stress	
Hearing Protection	
Head Protection	
Barricades	
Ladders	
Floor Openings	
Motor Vehicles	
Excavation	
Asbestos	
Other	
<b>STA Checklist</b>	
1. Should the Safety Department be involved in the planning of the job?	
2. Have all employees been briefed on the hazards associated with the job?	
3. Emergency and rescue equipment is located in the following areas:	
4. Will weather conditions affect the safe performance of this job?	
Other specific instructions:	



# **SECTION 7**

## **SITE SECURITY**

**SECURITY**

**A. PARKING**

Parking will be permitted in designated areas only. Signs shall be posted listing the authorized company(s) and rules governing the use of the area. All vehicles on the property will be at the risk of the vehicle owner and neither the Client, nor HART Engineering, accepts responsibility for damage to or theft of or from such vehicles.

**B. ENTRANCE GATE**

HART Engineering employees, project subcontractors, suppliers and/or vendors shall use only the designated gate for entrance to and exit from the job site. Procurement and contract personnel will make arrangements with vendors and subcontractors so that they will know which gate to use and job site location on the project. All deliveries to the project site must be coordinated in advance, in order to relieve potential impacts on project site material flows and municipal traffic patterns.

**C. WALKS AND ROADWAYS**

All personnel and/or subcontractors will use only designated walks and roadways when entering or leaving the job site, when moving from one area to another, or when obtaining and moving material. The use of short cuts or undesignated pathways is prohibited. Employee's not following project rules are subject to disciplinary action(s) that may include termination and restriction from any HART Engineering project worksites.

**D. IDENTIFICATION**

All personnel shall wear their I.D. badge at all times, when required, while on the project worksite. Employees shall only wear hard hats issued and/or approved by their employer.

Vendors and/or visitors will require permission to enter by a Subcontractor coordinator. The subcontractor's coordinator must contact the HART Project Team Office to obtain permission/authorization for entry by vendors, representatives and visitors. After permission has been granted, the vendor or visitor will sign-in on the project's 'Daily Muster Log' and then will be escorted at all times while on the project site. Prior to departure, vendors, representatives and visitors will sign-out with HART Engineering Site Manager.

All vendors or visitors within the worksites shall wear a hard hat issued by their respective organization or that of their host company only. All personnel within the worksite must wear Personal Protective Equipment compliant with HART requirements and is task appropriate.

All visitors to the HART project worksite shall obtain vehicle passes (when required) from Security displayed on dashboard while on-site.

**E. MATERIAL PASSES**

All tools and materials, other than trash, that are to be removed from the project must be accompanied by a material pass obtained from the HART Engineering Project Office. The material pass must be signed by a designated representative of HART Engineering and/or the Client. The HART Project Representative retains the original. Two copies

must accompany the material to the gate. One copy is to be provided to the gate guard, the other retained by the team member transporting and/or otherwise removing material.

**F. SEARCHES PERSON AND/OR PROPERTY**

HART Engineering and Client reserves the right to conduct a search of any person and/or property of HART Engineering employees and subcontractor(s), vendors and visitors when within the HART project worksite or upon the Client's property.

**G. GAMBLING**

Any and all forms of gambling are prohibited.

**H. CAMERAS**

Cameras are prohibited without the expressed written consent of the HART Engineering Project office, the HART Corporate Safety Director and/or the Client.

**I. LIQUOR, DRUGS, FIREARMS AND EXPLOSIVES**

Any person under the influence of or in the possession of any intoxicating liquor or illegal drug will not be permitted to enter the project or loiter on property.

Weapons, to include non-tool/non-task related knives, firearms, alcoholic beverages, narcotics or other controlled substances and explosives will not be permitted on the HART Project worksite of the Client's property, prevailing law notwithstanding.

**J. TRAFFIC REGULATIONS**

**1) Equipment Required on Motor Vehicles**

All motor vehicles within the worksite must be 'mechanically and structurally sound' and in safe operating condition.

All motor vehicles must be operated in a safe manner in accordance with project requirements and prevailing laws. Vehicle operations must also be conducted in a manner that accounts for prevailing conditions within the worksite.

When entering the any HART project worksite, all motor vehicles must display a valid state inspection sticker on the windshield.

All motor vehicles must be in sound operating condition and feature at least the following equipment in proper working condition for the vehicle to be considered safe and permitted for operation(s) within the HART worksite:

**(1) Reverse Motion Alarm**

(2) Seat Belts and/or Operator Restraints

(3) Rear-View Mirrors, Cameras and Other Reverse Operation Devices

(4) Brakes

(5) Lights:

a. Complete headlights;

- b. Complete tail lights,
  - c. Brake lights;
  - d. Beacon (as required)
- (6) Safety Glass; Complete and Undamaged
  - (7) Windshield Wipers
  - (8) Horn
  - (9) Muffler

Vehicles having dual wheels, or equipped with deep-tread tires shall be equipped with suitable mud-flaps on each wheel set so that objects will not be ejected past the flaps, when the vehicle is in motion.

**2) Driver's license**

Motor vehicle operators shall possess a valid state driver's license.

**3) Warning flags**

Red flags shall be used on any load that extends beyond the front, side, or rear of any vehicle.

**4) Traffic signs**

All traffic signs and signals, whether fixed or portable, shall be obeyed, and drivers must cooperate with team members appointed to direct traffic.

**5) Speed limit**

All vehicles shall be operated within the plant's posted speed limits.

**6) Driving and parking**

Vehicles shall be driven on the right side of street and be parked in areas designated for construction and contractor team member parking.

Vehicles shall not be parked in such a manner that may slow down, hinder, or otherwise interfere with the free flow of traffic.

***Vehicles shall not be parked in any way that blocks or impairs the access and use of fire hydrants or firefighting equipment.***

***No vehicles of any kind shall be left unattended with the motor running.***

**7) Right-of-way**

All motor vehicles shall give right-of-way to pedestrians, ambulances, and fire fighting equipment. Ordinary driving courtesy shall be practiced by all drivers of motor vehicles.

**8) Passengers**

Passengers shall be limited to the number determined by Original Equipment Manufacturer and shall not exceed the number of seat-belts/restraints provided.

Drivers of motor vehicles shall not permit passengers to ride on fenders, running boards, skips, enclosure or cab tops, or bumpers of motor vehicles.

Passengers shall keep all parts of their bodies inside the cab enclosures or body of vehicles, and must be seated and wearing OEM provided seat belts/restraints while the vehicle is in motion. Tailgates must be kept raised and secured in



position. Passengers shall not get on or off of any vehicle while it is in motion.

9) **Windshield or window obstruction**

Vehicles having nontransparent materials which interfere with clear visibility through any side window or windshield shall not be operated within the HART worksite.

All vehicles shall be equipped with functional and effective rear-view mirrors, cameras or other provided devices.

Vehicles or equipment with an obstructed view to the rear shall be equipped with a back-up alarm.

HART Engineering Corporation policy requires that reverse-motion alarms are required on all vehicles operating within the HART worksite.

10) **Obstructing streets, roads, fire equipment or fire fighting facilities**

When work activities or equipment obstructs a road or street, approved lights, barriers, warning devices, or signal persons shall be provided.

***Parked vehicles shall not block fire safety equipment, firefighting facilities, fire hydrants and/or access to same.***

- END OF SECTION -

# **SECTION 9**

# **COMPETENT PERSON DESIGNATION**

**COMPETENT PERSON DESIGNATION**

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**HART ENGINEERING CORPORATION**  
**Project Safety Manual**

**A. PURPOSE:**

To establish a uniform method of selecting, by definition, a competent person.

**B. RESPONSIBILITIES:**

- HART
- Subsequent Tier contractors

**C. REFERENCES:**

OSHA Construction Standards 1926.32.

**D. COMPETENT PERSON DESIGNATION:**

A 'Competent Person' is one who, because of training and experience:

is capable of identifying existing or potential hazards in the job being performed;

is capable of identifying working conditions that are unsanitary, hazardous, or dangerous to the Safety and health of the employee; and

has the authorization to take immediate corrective measures to eliminate the above conditions.

**E. DESIGNATING THE COMPETENT PERSON:**

The Project Manager or Superintendent, in conjunction with the HART Engineering Corporate Safety Director, designates the competent person, evaluates his or her performance, and ensures that a competent person is available for a required activity.

The Project Manager or Superintendent documents the designation of a competent person the attached form. The original of the form is forwarded to the Corporate Safety Director for recordkeeping, with a copy retained at the HART Project worksite.

**F. QUALIFICATIONS:**

The designated competent person must have an immediate knowledge of the subject, either by years of experience in the designated field, formal education, or specialized training in the:

- Job or activity being performed
- Current operations
- Technology and controls
- Potential hazards
- Safety and health standards as applied

**G. RESPONSIBILITIES:**

The competent person is responsible for ensuring the protection of all employees at the from hazards and compliance with required regulations governing operations, work practices, inspections, testing, repairs, machinery and equipment maintenance, and maintenance of the Accident Prevention Program that may include such areas as:

- Blasting
- Compresses Air & Gases
- Concrete Work
- Confined/Permit-required confined spaces, procedures
- Construction health hazard monitoring
- Crane operations and maintenance
- Electrical assured grounding
- Excavation and Trenching operations
- Fall Protection (Covers, Guardrails, Overhead Protection, etc.)
- Fire protection equipment
- First aid, CPR and blood borne pathogens
- Hearing protection
- Hand and power tools
- Hazard communication
- Housekeeping
- Ladders
- Lock out/control of energy sources
- Material handling and storage
- Mechanized equipment
- Motor vehicles
- Personal Fall Arrest Systems Equipment (Anchorages, Harnesses, Lanyards)
- Personal Protective Equipment and clothing
- Respiratory protection
- Rigging operations
- Site Sanitation
- Scaffold Erection
- Scaffold Inspection
- Traffic control program
- Underground excavation
- Underground construction
- Welding and cutting

A sample form for designating Competent Persons is attached to the end of this section as a convenience for all personnel including subcontractors and other related activities.

## **HART COMPANIES Competent Person(s) Designation Form**

Each worksite is required to have a comprehensive safety and health program that provides for frequent and regular inspections of various work areas, as applicable, by a designated competent person. The following person(s), as applicable, will represent

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**HART ENGINEERING CORPORATION**

as the

*Print Name of Company*

competent person(s), as defined by the Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1926.32 (f).

*“Competent” means possessing the skills, knowledge, experience and judgment to perform assigned tasks or activities satisfactorily as determined by the employer. The “Competent Person” means one who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous, or dangerous to employees and who has the “Authority” to take prompt corrective measures to eliminate them.*

Print Name(s) of Competent Person(s)

• Competent Person(s) – **General Worksite Safety**

○ Ray Lagesse or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Personal Protective Equipment**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Ladders/Ladder Use**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Scaffolds/Scaffold Inspection**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Fall Protection/PFAS**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Electrical Safe Practices/Assured Grounding**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Rigging Operations**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Fire Protection**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Compressed Air and Gases**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Hand and Power Tools**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Housekeeping**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Hazardous Energy Control**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Mechanized Equipment**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Hearing Protection**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Respiratory Protection**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Welding and Cutting**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Hot Work and Fire Watch**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Underground/Below Ground Construction**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Traffic Control and Coordination**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – **Concrete Work**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

HART Project Manager Signature \_\_\_\_\_ Date: \_\_\_\_\_

*Daniel Rampone, VP  
HART Engineering Corporation*



## **Sub-Tier Competent Person(s) Designation Form**

Each sub-tier company is required to have a comprehensive safety and health program that provides for frequent and regular inspections of various work areas, as applicable, by a designated competent person. The following person(s), as applicable, will represent

\_\_\_\_\_ as the  
*Print Name of Subcontractor Company/Sub-tier Activity*

competent person(s), as defined by the Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1926.32 (f).

*“Competent” means possessing the skills, knowledge, experience and judgment to perform assigned tasks or activities satisfactorily as determined by the employer. The “Competent Person” means one who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous, or dangerous to employees and who has the “Authority” to take prompt corrective measures to eliminate them.*

Print Name(s) of Competent Person(s)

• Competent Person(s) – **General Worksite Safety**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – \_\_\_\_\_ **(work activity)**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – \_\_\_\_\_ **(work activity)**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – \_\_\_\_\_ **(work activity)**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – \_\_\_\_\_ **(work activity)**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

• Competent Person(s) – \_\_\_\_\_ **(work activity)**

○ \_\_\_\_\_ or \_\_\_\_\_

Print Name(s) of Competent Person(s)

Sub-Tier Manager Signature \_\_\_\_\_

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