NSSGA®

NATIONAL STONE, SAND & GRAVEL ASSOCIATION

TAKE CONTROL

Prevent Serious Injuries and Fatalities

TABLE OF CONTENTS

TAKE CONTROL

Prevent Serious Injuries and Fatalities

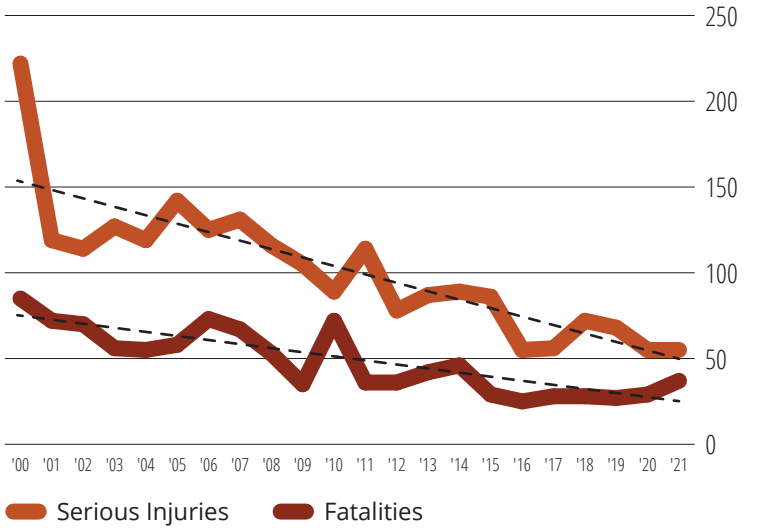
Disclaimer: *This document is to be used as a general guide, and it is not intended as a sole source of information, nor is it intended to provide legal advice. Users are encouraged to seek technical advice from equipment manufacturers, qualified professionals familiar with individual sites, safety programs, tasks, and company policies and procedures. Anyone using this document does so at their own risk. NSSGA is not responsible for any acts or omissions taken by any party using this document for reference.*

1.1 Why SIFs?

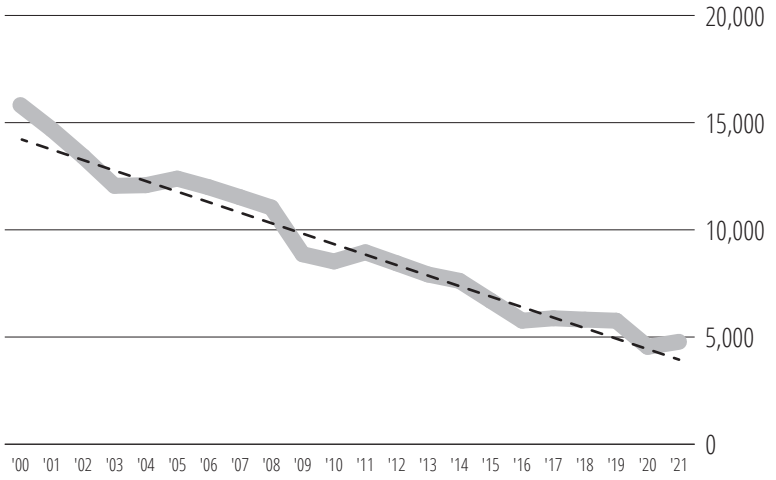
The stone, sand, and gravel industry is committed to the prevention of all injuries. However, industry experience suggests that there is a need to establish specific focus on the prevention of the mechanisms that result in serious injuries and fatalities (SIFs), which are injuries that are life altering, life threatening, or result in a fatality. The stone, sand, and gravel industry continues to experience a steady decline in reportable injuries, but the decline in serious injuries and fatalities has not been as quick by comparison and has plateaued in recent years.

Evidence shows that not all events have the potential to lead to a serious injury or fatality, and the absence of reportable injuries does not indicate a company will not have an SIF event in the future. The strategy for reducing SIFs involves the identification of situations with a high potential to cause an SIF; identification of critical controls; monitoring of those controls; and review of SIF events for organizational learning and improvement. It is important to note that this process does not exclude existing injury prevention programs in the industry, but rather provides increased clarity and focus on one part of injury management and prevention.

Progress Reducing Serious Injuries and Fatalities (SIFs) 2000-2021
(metal/non-metal number of serious injuries and fatalities)



Progress Reducing Other Injuries 2000-2021
(metal/non-metal number of injuries excluding serious injuries and fatalities)



1.2 The Role of Management

Organizational leaders must be committed to putting safety first and leading efforts to ensure employees are provided with safe workplaces. To best understand how to improve systems, organizations must intentionally collaborate with and engage workers at every level. Employees are the greatest source of intelligence within an organization and leaders should recognize the importance of employee input and work to enhance their engagement.

This guidance document has been created to help workers and organizational leaders recognize situations with the potential to cause an SIF and take proactive steps to prevent them from occurring. Through committed leadership and engaged employees, implementation of this program can help raise awareness of situations with high-SIF potential and ensure critical controls are in place before work begins.

Leaders must be relentless in the pursuit of providing workers with safe workplaces. This guidance along with input from boots-on-the-ground workers can help build and support a workplace focused on eliminating serious injuries and fatalities.

1.3 How to Use the *Take Control* Program

This prevention guide is intended to increase awareness around situations and tasks with the potential to cause serious injuries and fatalities; identify such situations and tasks; and help guide decision-making around critical controls that should be in place prior to work beginning. This guide is not all inclusive and should be used in conjunction with individual company policies and procedures. Example checklists and plans are provided, which can be used to supplement or update company written plans.

Resources including videos, discussion questions, relevant Fatalgrams, and posters accompany this written guide, and all are intended for training for both new and experienced miners. Discussion and a high degree of participation from miners at all levels is strongly encouraged. It is recommended that operators focus on one topic at a time with their teams and use the *Take Control* program resources to evaluate current company programs, policies and procedures and identify gaps. This program is intended to supplement existing programs, not replace them.

Identify Situations with High SIF Potential

The first step in SIF prevention is identifying situations that have a high SIF potential. This program identifies 10 common situations on mine sites that present a high SIF potential:

If an activity, task, or exposure involves one or more of these situations, then it should be considered to have a high SIF potential and critical controls must be identified and implemented.

1. working at heights;
2. confined space entry;
3. lock out-tag out/energy isolation;
4. vehicle isolation;
5. lifting and rigging;
6. drilling and blasting;
7. working around water;
8. working around highwalls;
9. working around moving machine parts; and
10. contractors.

Identify Critical Controls

Critical controls are those controls that must be in place to prevent someone from being seriously or fatally injured. For example, a fall arrest system is a critical control for work being conducted at a height, and a completed confined space entry permit is a critical control when entering a confined space. The failure of a critical control could result in a serious injury or fatality. Critical controls are identified in this guide for each of the 10 high-SIF potential situations; however, because each task and operation is unique, there may be other controls that should be considered and implemented.

Prior to beginning a task, conduct a risk assessment (see Section 2). For specific, known high-hazard tasks within your organization, a risk assessment should be conducted that includes all those involved with the task. In addition, a risk assessment should be conducted

for non-routine tasks. This may be a task that is seemingly not hazardous in nature, but because it is conducted infrequently, those involved with the task should be refreshed on what needs to be done to complete the task safely. Finally, even routine, non-hazardous tasks can change during the course of work. When a routine task becomes complicated or the scope or conditions of the work change, a risk assessment should be completed.

Once a risk assessment has been conducted, use the flow chart below to identify if the task has a high potential of causing a serious injury or fatality, then refer to the appropriate section in the guide for further considerations about the activity and critical controls to be put in place.

USING THE *TAKE CONTROL* PROGRAM

IF
THE TASK TO BE PERFORMED IS:

1. **A known high-hazard task**
2. **Non-routine (even if it does not seem dangerous)**
3. **Routine, but becomes complicated or conditions of work change during the task**

THEN
CONDUCT A RISK ASSESSMENT

Does the work identified include any high hazard activities on this list?

1. Working at heights
2. Confined space entry
3. Working with electricity or stored energy
4. Operating or working around mobile equipment
5. Lifting and rigging
6. Drilling and blasting
7. Working around water
8. Working around highwalls
9. Working around moving machine parts
10. Contractors

YES
Identify and implement critical controls

NO
Follow customary safety precautions

2.1 What Is a Risk Assessment?

A risk assessment is a proven way to manage the many hazards associated with mining; characterize the risks they present; and put controls in place to lower these risks to acceptable levels.

Typically, risk acceptability is characterized by managing risk to as-low-as is reasonably achievable (ALARA) or as-low-as is reasonably practicable (ALARP). A risk assessment is a systematic process conducted by a competent person or persons who evaluate the task, identify potential hazards, analyze risk, control those risks, and document the assessment and corrective actions taken. A risk assessment may also be called a Job Safety Analysis (JSA) or Job Hazard Analysis (JHA).

2.2 Why Conduct a Risk Assessment?

Risk identification and minimization provides workers with a level of protection that goes beyond compliance.

Risk assessments force workers to evaluate a task before starting work, which helps reduce serious injuries and fatalities because hazards identified beforehand can be removed or controls can be put in place to minimize risks. Miners themselves, who are most familiar with the risks because they are closest to them, must be involved in risk assessments because their expertise can help better control risks. Risk assessments address all types of work environments including large projects such as work zones, traffic patterns in facilities, construction and/or relocation of facilities, special projects, and more. Risk assessment programs are the backbone of successful safety processes.

2.3 How to Conduct a Risk Assessment

First, prior to a task being performed, hazards are identified and assessed. Next, the mine operator decides whether to eliminate, mitigate or tolerate these hazards.

Risk assessments include hazard identification, recognition of who could be harmed and how, evaluation of risks, decision-making around controls and record keeping. There are many different styles of risk assessments (e.g., Job Safety Analysis or Job Hazard Analysis) and examples are provided in this program. First, prior to a task being performed, hazards are identified and assessed for their level of risk. Next, the mine operator decides whether to eliminate, mitigate or tolerate these hazards. Typically, it is most effective to eliminate hazards early in the life of a mine or processing facility (i.e., during the planning stages), or when significant changes are being made to mine processes because these situations provide opportunities to eliminate hazards through design and engineering controls. Mitigation actions can take the form of equipment, tools, or other mechanisms to control hazards. If a hazard is tolerated, then administrative controls, specialized training, or recovery measures are used to minimize risk. As mitigation actions are taken, their effectiveness must be carefully monitored on a regularly scheduled basis and changes should be made as needed and documented.

3.1 Working at Heights

Fall protection is defined as any means used to protect workers from fall hazards. Fall protection is essentially a system that protects workers who could lose their balance at any given height (four feet in General Industry) from falling, usually resulting in injuries. Fall protection involves the elimination of fall hazards; the prevention of falls; and the control of falls.

HIGH POTENTIAL SITUATIONS

The following are examples of situations when working at heights has a high SIF potential. This list is not exhaustive and critical controls should be implemented for all work conducted at heights.

- Working on an elevated platform (e.g., scissor lift, manlift)
- Working at a height where there is no handrail or guardrail present
- Working at a height where fall arrest equipment is required

CRITICAL CONTROLS

- Fall prevention devices (harness, positioning devices, anchor points, lanyards, connectors, etc.) are inspected for wear and tear before use.
- Scaffolding and elevated platforms are equipped with guardrails and toe-boards.
- Surface openings are barricaded, covered, or guarded. Caution tape is not a substitute for barricades. An exclusion zone is established beneath the work area.
- Ladders are set on a firm base, correctly angled (4:1 ratio) and tied off.
- 100% tie off is used with full-body harness.
- Anchor points are strong enough (i.e., they can support at least 5000 pounds per person attached).
- Anchor points are high enough so that a fall will clear any obstructions and limit free fall.
- A plan is in place to quickly rescue fallen or suspended employee(s). All employees are familiar with the plan and know where to access it.

3.2 Confined Space Entry

A confined space is defined as any space or structure which by design has limited or restricted means for entry or exit, is not intended for continuous occupancy by a person, but is large enough and configured so a person can enter the space and perform work. Facilities should be evaluated to identify all permit-required confined spaces. Supervisors must inform employees of confined spaces and their dangers; post warning signs; and shall take measures to prevent unauthorized entrants from entering permit-required spaces. If permit-required spaces exist, a supervisor must develop and implement a written confined space entry permit program. The written program must be available for inspection by employees and their authorized representatives.

HIGH POTENTIAL SITUATIONS

The following are examples of situations involving confined spaces that have a high SIF potential. This list is not exhaustive and critical controls should be implemented for all confined space work.

- Maintenance work when in a permit required confined space, i.e., a confined space that has one or more of the following characteristics:
  - Contains or has a potential to contain a hazardous atmosphere;
  - Contains a material that has the potential for engulfing an entrant;
  - Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
  - Contains any other recognized serious safety or health hazard.

CRITICAL CONTROLS

- A "Confined Space Entry Permit" is fully completed, and the entry supervisor has signed the permit certifying the space is safe for work prior to anyone entering the Permit Required Confined Space. Key aspects of an entry permit include:
  - Job details outlined including purpose of entry.
  - Pre-entry meeting and review is completed, including training verification of all involved.
  - Authorized entrant(s) have been identified and entry supervisor has reviewed/signed off.
  - Authorized attendant understands job duties and is not engaged in any other work.
  - Atmospheric monitoring is conducted and level(s) at which entry may occur have been identified and verified.
  - Communication procedures, methods, and equipment are identified and followed — including the emergency communication system.
  - Area is appropriately prepared for entry (e.g., area is flagged, barricaded, lit, etc.).
  - Necessary PPE is checked for wear, tear, damage, etc. (e.g., hi-visibility clothing, hardhat, eye protection, safety boots, respiratory protection, hearing protection, fall protection, etc.) and is worn during entry.
- Rescue procedures are in place, which include entrants wearing a harness and having a lifeline or being tied off.
- Rescue and retrieval equipment is readily available.

3.3 Working with Electricity or Stored Energy

Knowledge of equipment and machinery, how it works and what it does, is very important for a solid understanding and application of the Lockout Tagout (LOTO) policy. Every site should have equipment specific LOTO procedures, and only authorized employees that have had hands on training on a specific piece of equipment should be involved with the Lockout and Tagout process.

HIGH POTENTIAL SITUATIONS

The following are examples of types of energy with a high SIF potential. This list is not exhaustive and critical controls should be implemented for all work requiring lockout/tagout or when working with stored energy.

- **Electrical energy** - Maintenance on any equipment that is powered by electricity, batteries, or internal combustion engines
- **Stored energy** - Maintenance of hydraulic and pneumatic equipment/implements (e.g., hydraulic arms)
- **Potential energy** - Maintenance of something with the potential to move, shift, or rotate (e.g., equipment that has an eccentric shaft or is in an unstable position when not operating)
- **Gravitational energy** - Work with a gravitational component (e.g., materials with potential for engulfment)

CRITICAL CONTROLS

- Electrical energy sources are properly identified, locked and tagged out.
- Equipment adjacent to, directly above or below and equipment feeding or discharging from the equipment to be worked on is locked and tagged out. Equipment interlocks should be factored into the lockout/tagout.
- Equipment is tested to demonstrate that the proper equipment is locked out and re-energization cannot occur. Independent verification (i.e., verification by a supervisor or competent person) is preferred; if independent verification is unavailable, then a self-check is performed.
- Company arc flash procedures are in place, understood and followed.
- Stored pressure is bled off, drained, blanketed and/or isolated for lines carrying pressurized material.
- Prior to performing maintenance on a piece of stationary or mobile equipment, all components are secured from movement or activation and a check for zero energy is conducted.

3.4 Operating or Working Around Mobile Equipment

When the worksite involves moving traffic, safety awareness should be at its peak to protect everyone on site. Incidents involving mobile equipment are consistently one of the leading causes of SIFs in the aggregates industry. Changes or unusual conditions should be communicated to workers immediately and vehicles and pedestrians should be separated as much as possible. If equipment is defective or broken it should be fixed or replaced immediately.

HIGH POTENTIAL SITUATIONS

The following are examples of situations when operating or working around mobile equipment that have a high SIF potential. This list is not exhaustive and critical controls should be implemented for all work involving operating or working around mobile equipment.

- Operating mobile equipment:
  - Around pedestrians
  - When equipment interacts with other equipment (e.g., during loading/unloading of material)
  - Around hazardous areas (e.g., highwalls, water, dump points, or powerlines)
- Working on foot around mobile equipment (including pickup trucks and light support vehicles)
- Operating a pickup truck or light support vehicle around large equipment like haul trucks that have significant blind spots

CRITICAL CONTROLS

- Seatbelts are worn every single time anyone operates or rides in any vehicle.
- Vehicle pedestrian segregation plans (see examples included in program) are implemented and posted/provided to non-employees who will interact with or work near mobile equipment.
- Practices are established and followed to increase employee visibility (e.g., high-visibility clothing/PPE is worn).
- Practices are established and followed to increase vehicle visibility (e.g., whip flags are installed on trucks and light support vehicles).
- There is adequate communication between equipment operators (e.g., three-part communication is used).
- Adequate signage and barriers are used onsite (e.g., barricades, flagging, berms).
- Materials are dumped at a safe distance back from edges and pushed with a dozer.
- People coming to pick up equipment or material stay in their vehicle.
- Equipment is operated free of distractions (see distractions audit included in the appendices).
- Vehicle safety features are working properly and routinely checked (e.g., lighting, cameras, backup sensors, mirror placement, etc.).
- Operators sound the horn before movement.
- Appropriate speed limits are set and followed.

3.5 Lifting and Rigging

Suspended loads must always be treated with caution. Those involved in lifting operations must be properly trained and qualified in the operation of each specific lifting device that he/she may operate. This includes employees who are required to attach a load to a lifting device (crane, boom truck, overhead hoist, floor hoist, etc.). It is critical to remember that a successful lift begins before an operator gets in the cab – lifting capacities of both the lifting device itself and associated rigging must be taken into account.

HIGH POTENTIAL SITUATIONS

The following are examples of lifting and rigging situations with a high SIF potential. This list is not exhaustive and critical controls should be implemented for all lifting and rigging work.

- Any lift requiring a loader or mobile, overhead, or truck cranes (e.g., lifting a crusher to platform during replacement/repair, unloading parts from delivery trucks)
- Tandem lifts
- Any item that needs to be rigged

CRITICAL CONTROLS

- Only qualified or certified crane operators, riggers and signalmen with the required experience are involved in the lift.
- All lifting devices and cranes are inspected prior to use.
- A lift plan is conducted if the lift exceeds 75% of the rated capacity at the configuration used, requires the use of more than one crane, involves the lifting of personnel in a platform or basket, or presents special hazards or circumstances.
- The weight of the load to be lifted is determined before selecting rigging equipment and rigging hardware.
- Non-conductive tag lines are used to guide loads.
- Proper clearance, to include crane's full extension radius, is maintained when working near overhead power lines.
- Pick-up, lay-down and crane operating areas are barricaded and secure.
- There is proper space, ground conditions and outrigger deployment for mobile crane operations.
- No one climbs on or walks under suspended loads.
- One person is designated as the signaler; the crane operator only moves loads on signals from this signaler.

3.6 Drilling and Blasting

Blasting is an integral part of many surface mining operations and each step of the process from loading the explosive material to detonation has critical safety elements that must be taken into consideration. Each company with blasting operations should have a Blasting Program in place that includes proper training given to each involved employee.

HIGH POTENTIAL SITUATIONS

The following are examples of drilling and blasting situations with a high SIF potential. This list is not exhaustive and critical controls should be implemented for all drilling and blasting work.

- Drilling and blasting near the edge of a highwall
- Loading of explosive material
- Loading of shot material
- Detonation
- Handling of misfires
- Scaling of a highwall following a blast

CRITICAL CONTROLS

- Manufacturers' guidelines are followed for the storage, handling, transporting and use of explosive materials.
- Explosive storage areas are kept clean, dry and orderly.
- Inventory of explosive materials is rotated, and oldest stock is used first.
- All locations where explosives are stored or used are properly ventilated before miners enter.
- Damaged or deteriorated explosive materials, including initiation (detonating) devices, boosters, dynamite and blasting agents are not used. The explosives manufacturer is contacted if damaged, deteriorated or outdated explosives are discovered.
- Technologies, such as face profilers and borehole probes, are used to obtain details about areas of weak burden and potential borehole deviation.
- There is adequate communication with the driller and understanding of the blast site's geology.
- A drill pattern appropriate for the location has been developed and stemming depth and/or decking is adjusted to maintain adequate burden for the blast.
- Site-specific blast plans are reviewed and followed prior to loading any explosives.
- Blast area is established, and all persons are removed from the area before the blast is fired.
- Access routes to blast area are guarded or barricaded to prevent people and vehicles from entering.
- No open flames, matches or cigarettes are allowed within 50 feet of the blast site.
- Only the blast crew handles explosives, but anyone can stop the job.
- Anyone entering the blast site must have steel toed shoes, safety glasses, hard hat, high visibility vest/shirt, vest or jacket, gloves, and a hazard briefing from the Blaster.
- Before firing a blast, ample warning is given to allow all persons to be evacuated from the blast area.
- Absolutely no access is permitted into the blast area between the time the warning signal is sounded, and all clear signal is given.
- A post-blast inspection is conducted to be certain the blast area is safe before anyone re-enters.

3.7 Working Around Water

Settling ponds that provide process and wash water are essential features at aggregate facilities. Miners may also encounter sumps or work at barge loading or unloading areas. Therefore, miners inevitably will find themselves working around water frequently and need to take steps to keep themselves safe while working around these or other bodies of water. To prevent serious injuries and fatalities while working around water, proper policies and procedures must be in place and adhered to, including the availability, use, and maintenance of correct PPE.

HIGH POTENTIAL SITUATIONS

The following are examples of situations when working around water that have a high SIF potential. This list is not exhaustive and critical controls should be implemented for all work conducted around water.

- Working or operating equipment around water's edge
- Working over water

CRITICAL CONTROLS

- A means of escape from equipment is provided in case of an emergency (e.g., seatbelt cutter and window breaker).
- A throwable life ring is accessible at areas of water where work takes place (e.g., pumps).
- Electrical cables used around water are rated for use around water and have proper ground fault protection.
- Equipment is kept a safe distance back from the water's edge.
- Handrails are provided around docks and work boats.
- Roadways are properly bermed near water hazards.
- Coast Guard approved Type I or Type V personal flotation devices (PFDs) are worn when working around water.
- Personal flotation devices are regularly inspected for wear, tear, and damage and expiration dates are checked for styles that expire (e.g., auto-inflate PFDs).
- PFDs are properly stored in a cool, dark, dry place with no heavy objects on them, which can crush or damage performance.
- should avoid working alone, near, or over water. If someone must work alone near or over water, a communication plan is in place.

3.8 Working Around Highwalls

Miners are consistently working around highwalls while an aggregate operation is in production. Whether loading or dumping material; benching; or preparing to blast, highwalls present consistent potential hazards that must stay top of mind because — even though they may seem unwaveringly present — highwalls are consistently changing just like the work being done around and at the edge of them.

HIGH POTENTIAL SITUATIONS

The following are examples of situations when working around highwalls that have a high SIF potential. This list is not exhaustive and critical controls should be implemented for all work around highwalls.

- Working at/around the base of highwalls
- Working at/around the edge of highwalls
- Dumping of material near top of highwalls
- Working on benches
- Scaling of highwalls
- Drilling and blasting around highwalls

CRITICAL CONTROLS

- Know what work is occurring around you, including:
  - Drill and blast activity
  - Heavy equipment operation above you
  - Excavation work
  - Mucking
  - Installation of ground support (underground)
- Highwalls are inspected to ensure there are no signs of instability (loose rocks etc.). Undercuts are evaluated before approaching crests, edges or drop-offs.
- Dump areas are approached via a clear line of sight and setbacks are established.
- Unsafe conditions are barricaded or blocked and posted with warning signs, until the hazard has been addressed.
- Berms at the base of highwalls are a minimum distance from the base of the highwall of 25% of the highwall height.
- Workers do not stand or park equipment below an area where a rock fall could occur.
- Workers do not stand or work between a highwall and mobile equipment.
- No one enters barricaded areas without authorization.
- Workers regularly look and listen for signs of unstable ground before starting work and continuously while they are working.
- Slopes adjacent to road traffic are evaluated for stability issues.
- Workers involved in blasting operations close to the edge of a highwall use fall protection.

3.9 Working Around Moving Machine Parts

Moving machine parts are located throughout aggregate facilities – especially at the plant and on conveyors. Guards are essential to protect miners from becoming entangled in moving machine parts. Miners must also understand the types of guards and systems used at the mine, so they can recognize the hazards; know how the guards are properly applied; how and when they can safely remove guards, when to replace them, and what to do if a guard is missing or damaged.

HIGH POTENTIAL SITUATIONS

The following are examples of situations involving working around moving machine parts that have a high SIF potential. This list is not exhaustive and critical controls should be implemented for all activities where there is exposure to moving machine parts.

- Performing maintenance on components where there is exposure to moving machine parts (e.g., conveyor drives, head pulleys, or tail pulleys)
- Working in an area near moving machine parts
- Troubleshooting equipment where there is exposure to moving machine parts

CRITICAL CONTROLS

- All moving machine parts within seven feet of a walking or working surface are properly guarded while machinery is being operated.
- Guards are sufficiently constructed so miners cannot circumvent or bypass the guard (i.e., a miner cannot get their hand around the guard and reach the moving part).
- Prior to work beginning, guards are inspected for damage and to ensure any removed guards have been replaced.
- Guards are only removed when testing machinery, conducting maintenance, or replacing a guard and lock-out tag-out procedures are followed.
- Guards are immediately replaced and resecured after they have been removed to test machinery, conduct maintenance, etc.
- Guarding materials and fastening methods are securely installed and able to withstand wear, corrosion, vibration, and shock of normal operations.
- If a drive belt fails inside a guard, the whipping action of the broken belt will be contained.
- Workers do not walk on, across, or over conveyor belts without the belts being properly locked and tagged out, secured from movement, and proper fall protection being used.
- Emergency stop cords are equipped on unguarded conveyors next to travel ways. Stop cords are routinely inspected and maintained to keep adequate tension and function.

3.10 Contractors

Having contractors working on a mine site can present some of the most difficult safety challenges. Contractors may be far less familiar with the mine site compared to other employees, have different safety training or culture, be conducting non-routine or other types of specialized work, and more. Clear and consistent communication coupled with implementation of critical safety controls is of utmost importance for everyone onsite – both mine employees and contractors. Be sure contractors are familiar with high-risk tasks that they may encounter onsite and what critical controls need to be in place.

HIGH POTENTIAL SITUATIONS

The following are examples of contractor tasks that have a high SIF potential. This list is not exhaustive and critical controls should be implemented for all contractor work.

- Any work involving situations identified in 3.1-3.9:
  - Working at heights
  - Entering a confined space
  - Working with electrical or stored energy
  - Operating or working around mobile equipment
  - Lifting and rigging
  - Drilling and blasting
  - Working around moving machine parts
  - Working around water
  - Working around highwalls

CRITICAL CONTROLS

- A "Questions to Ask your Contractors" (see examples in this program) checklist is used before hiring.
- Contractors have appropriate pre-qualifications including:
  - Proper licensing, training/qualification/expertise, work history, etc.
- Contractors have been given site specific training and have appropriate up-to-date task training.
- A pre-job walk is performed that includes outlining a clear scope of work and job hazard analysis (JHA) prior to contractors beginning work.
- Contractor work is isolated from active operations when possible.
- Appropriate contractor permit systems or workplans are in place.
- A site/safety person or persons are designated and assigned to do work approvals, spot checks, work verifications, etc. with contractors.
- Contractors are involved in pre-work daily meetings when onsite.

APPENDIX A: EXAMPLE RISK ASSESSMENTS

1. Tasks that Kill
2. Work Hazard Assessment
3. Workplan

Tasks That Kill

JSA/RISK ASSESSMENT FORM

1. What specific task(s) will you perform?

2. What are the most likely hazards associated with this task?

(Consider some of the following: Manual lifting, awkward load/position heavy objects (>50lbs), hoisting and rigging equipment (chains, straps & hooks) in good condition, load capacity adequacy, protection of workers on foot, adequacy of communication, rotating/moving equipment or machinery, adequate lighting, correct signage, congested work areas, slip/trip hazard, hot material, overhead hazards, capacity and securement of ladders, manlift is better than using fall protection, 3 points of contact, maintaining 10 feet from equipment/establish eye contact, night paving, backing trucks).

3. What measures are being taken to mitigate the hazards?

4. What are the proper tools for this task?

5. Does this involve LOTO activities? ☐ **Yes** ☐ **No**

a. If yes, have you reviewed LOTO steps for this task?
b. Have you reviewed the component specific LOTO step for this task?
b. Have you reviewed the component specific LOTO step for this task?

6. Does this activity involve confined space? ☐ **Yes** ☐ **No**

a. If yes, are all affected employees familiar with confined space processes for this task?
b. If yes, are all confined space processes in place according to our program and permits?

7. Does this involve LOTO activities? ☐ **Yes** ☐ **No**

a. If using a ladder, is it secure and capable of supporting the load?
b. Is there a way to use a manlift to perform the job?
c. Are there appropriate anchorage points to use to tie off to?

8. What specialized PPE will be used for this task?

(Coveralls, knee pads, goggles, face shield, welding hood, hearing protection, respirator, gloves, fall protection, etc.)

9. What measures are being taken to ensure that the vehicle / pedestrian segregation is appropriate?

(Use of a spotter, barrier, etc.)

10. Is this a work zone?

a. If so, will drivers have a spotter when backing toward a material transfer vehicle? If not, what measure will be used to ensure backing can be done safely?
b. If a night job, is there adequate lighting, working back up alarms, and appropriate night work PPE?
c. Is all internal traffic aware of the entry and exit points?
d. Are Flaggers clearly visible and positioned correctly with an escape route?

Remember to advise all the employees working with you and in the surrounding area of your activities.
If an employee has not been trained, they should not be involved in performing the task

Work Hazard Assessment (WHA)

Part 1: Work Details

WORK (JOB OR TASK):				**SITE:**		
DATE:		**SITE SUPERVISOR / MANAGER**		**REV:**	**WHA NO.**	
ROUTINE OR NON-ROUTINE:	**ROUTINE:** ☐ **NON-ROUTINE:** ☐	WORK INSTRUCTIONS / STANDARD OPERATING PROCEDURES (SOPs) IN PLACE? **YES** ☐ **NO** ☐		DO ROUTINE WORK INSTRUCTIONS / SOPs NEED TO BE DEVELOPED (e.g. NEW JOB OR TASK?) **YES** ☐ **NO** ☐		
		IF YES, ATTACH OR INCLUDE PROCEDURE TITLE(S) / NUMBER(S):		IF YES, NOTE RESPONSIBLE PARTY (INDIVIDUAL / DEPARTMENT) TO DEVELOP PROCEDURES: IF NO, NOTE REASONS WHY WORK INSTRUCTIONS / SOPs NOT NECESSARY:		

JOB DETAILS	PPE REQUIREMENTS
Frequency of Job Performance:	**Standard PPE that includes**: ▪ Hi-visibility clothing or safety vest ▪ Safety hardhats in accordance with ANSI Standards within designated areas ▪ Eye protection in accordance with ANSI Standards within designated areas ▪ Safety boots in accordance with ANSI Standards ▪ Hand protection specific to work to be conducted
Personnel at Risk (Job Positions):	
Number of Personnel Involved:	
Operating Equipment / Process(es) Involved:	**Additional SPF PPE that includes**: ☐ Hearing protection in accordance with ANSI Standards within designated areas ☐ Fall protection in accordance with ANSI Standards ☐ ☐
Other Equipment / Tool(s) to be Used:	

Work Hazard Assessment (WHA)

Part 2: Health & Safety Hazard Assessment & Control Worksheet

STEP NO.	JOB PROCESS STEPS	POTENTIAL HAZARDS Refer to Hazard Checklist Reference Sheet	INITIAL RISK SCORE Refer to Matrix			HAZARD CONTROL MEASURES	RESIDUAL RISK SCORE Refer to Matrix			COMMENTS
			Conseque	Likelihood	Risk		Conseque	Likelihood	Risk	
1						• **Engineering**: • **Administrative**: • **PPE**:				
2						• **Engineering**: • **Administrative**: • **PPE**:				
3						• **Engineering**: • **Administrative**: • **PPE**:				
ON THE DAY OF CARRYING OUT THIS WORK, IF THERE ARE ANY ADDITIONAL HAZARDS IDENTIFIED THEN CONTROLS MEASURES MUST BE IDENTIFIED AND IMPLEMENTED AND WHA IS TO BE AMENDED / REVISED / SUPPLEMENTED										
References:										

Work Hazard Assessment (WHA)

Part 3: Health & Safety Job Control Summary

KEY HEALTH & SAFETY ISSUES TO BE MANAGED & CONTROLS TO BE IMPLEMENTED AS IDENTIFIED IN HAZARD ASSESSMENT *(e.g., exposure to road traffic, hazardous substances, manual handling, falls):*
Exposure to toxic gases / vapors, toxic dusts / fumes and fixed plant / mechanical energies through the implementation of the following controls: • **Engineering**: • **Administrative**: • **PPE**:

LIST ENGINEERING DETAILS, WORKCOVER OR INTERNAL APPROVALS REQUIRED TO COMPLETE THE JOB
☐ Hot Work Permit ☐ Confined Space ☐ Energy Isolation ☐ Electrical Work ☐ Critical Lifts (Heavy Lifting Tasks) ☐ Work at Heights ☐ Barricades ☐ Excavation ☐ Other: N/A

Applicable NAM Protocols	Applicable Region or Facility Practices in Place
1. 2. 3. 4.	1. 2. 3. 4.

Part 4: WHA Participation and Authorization

WHA Initiated / Developed by (List All Names):	**MANAGEMENT REVIEW** **Approved by:** **Date Developed**: **Signature**:

Work Hazard Assessment (WHA)

Evaluate all the potential hazards associated with the work task under assessment.

- ☐ 1. Vehicles / Equipment / Pedestrian Segregation
- ☐ 2. Electrical / Energized Equipment / LOTOTO
- ☐ 3. Mechanical / Stored Energy / Pressurized Systems
- ☐ 4. Rotating Equipment
- ☐ 5. Working at Heights
- ☐ 6. Confined Space
- ☐ 7. Gravity / Overhead Hazards / Falling Items / Rigging
- ☐ 8. Working Over Water
- ☐ 9. Use of Heavy Equipment
- ☐ 10. Lifting Operations
- ☐ 11. Sharp Tools / Cuts
- ☐ 12. Thermal / Fire / Explosion (Hot Work)
- ☐ 13. Electrical Cords / Tool Conditioning
- ☐ 14. Spill Potential / Environmental Impact Concerns
- ☐ 15. Weather Conditions
- ☐ 16. Work Environment Climate / Hot / Cold
- ☐ 17. Ergonomics / Body Position / Line of Fire
- ☐ 18. Radiation
- ☐ 19. Workplace Noise / Dust / Fumes / Mist / Aerosols
- ☐ 20. Chemical and Hazardous Material Manual Handling
- ☐ 21. Training / Personal Limitations
- ☐ 22. First Time Performing Task / New Task
- ☐ 23. Work Environment / Permit Required
- ☐ 24. Overlapping Work Areas
- ☐ 25. Other

WORKPLAN

Facility:	Specific Location:	Date:	Time:
Permits / Checklists / Forms Required: ☐ Hot Work ☐ Confined Space ☐ Lift Plan ☐ OPS 9 ☐ Trenching ☐ Workplace Exam			
Employees Assigned:			
Description of Work:_____			

Anticipated Hazards

Before beginning/resuming work, STOP, THINK, and IDENTIFY all the hazards associated with the task and in the work area (circle or check below)

Struck or Caught	1 Crushed By	2 Suspended Load	3 Falling Object	4 Flying Object	5 Comp. Gas	6 Sharp Object	7 Low Headroom	8 Pressure release	9 In Between	10 In Machine
Burn	11 Open Flame	12 Explosion	13 Flam. Gas	14 Corrosive Mat.	15 Hot Work	16 Hot Material	17 Electric Shock	18 Hot Surface	19 Cold Surface	20 Fire Hazard
Health	21 Inhalation	22 Noise	23 Toxic Material	24 Harmful Light	25 Confined Space	26 Engulfment	27 Snake / Insect	Manual Handling	28 Bending Lift	29 Reaching Lift
Work Environment	30 High Temp.	31 Low Temp.	32 Weather	33 Look Up! Power Lines	34 Wind	Traffic	35 Truck / Car	36 Mixer	37 Mobile Equip.	38 Pedestrian
Fall	39 Stairs	40 Ladder	41 Open Edge	42 Slip	43 Trip	44 Into Water	Tools	45 Hand Tool	46 Power Tool	47 Safety Knife

Job Steps and Hazard Recognition (Identify, Evaluate, and Control)

#	Specific Hazards Identified	Hazards Controlled By

Serious Injury and Fatality (SIF) Exposure Assessment	YES	NO
For the tasks and hazards identified above, do any of them have SIF rexposre? (SIF Exposures & Critical Controls are listed on back of the sheet) If yes, complete the back of this document to ensure all critical controls are identified, understood, and controlled.	☐	☐
Does the work crew understand the severity of the SIF risk?	☐	☐
Are all necessary SIF critical controls available and ready for use?	☐	☐
STOP WORK is an obligation and expectation. Is the crew willing to STOP WORK if an SIF critical control is missing?	☐	☐

Tools, Equipment, PPE (check if required)

☐ Fire Extinguisher	☐ Lifelines	☐ Hand Tools	☐ Hearing Protection	☐ Two-Way Radio
☐ Safety Glasses/Goggles / Faceshield	☐ Extension Cords w/GFCI	☐ Tag Lines	☐ Protective Gloves	☐ Respiratory Protection
☐ Full Body Harness	☐ Protective Clothing	☐ Blocking Material	☐ Rigging Equipment	☐ Arc Flash Gear
☐ Anchorage Point (beam straps)	☐ Welding Curtain	☐ Power Tools	☐ Locks/Tags	☐ Lighting

Are all hazards understood, controlled, proper tools, equipment and PPE attained, and everyone has the proper skills, training, knowledge, and time for the task?

☐ Yes, proceed

☐ No, do not proceed until corrected

Signature of Person in Charge: _____

Signature(s) of Employee's Assigned: _____

_____

WORKPLAN (cont)

Serious Injury and Fatality (SIF) Pre-Task Critical Controls Validation

Y	N/A	ENERGY ISOLATION CRITICAL CONTROLS
☐	☐	Electrical energy sources are properly identified and locked and tagged out.
☐	☐	Equipment adjacent to, directly above or below and equipment feeding or discharging from the equipment to be worked on is locked and tagged. **EQUIPMENT INTERLOCKS WERE FACTORED INTO THE LOCKOUT/TAGOUT.**
☐	☐	Verification is performed that the proper equipment is locked out.
☐	☐	Arc flash protective equipment and procedures are understood and being followed.
☐	☐	Stored pressure is bled off, drained, blanketed and/or isolated for lines carrying pressurized material.
☐	☐	Prior to performing maintenance on a piece of stationary or mobile equipment, all components are secured from movement or activation.

Y	N/A	WORKING AT HEIGHTS CRITICAL CONTROLS
☐	☐	Fall prevention (harness, positioning devices, anchor points, arrest systems) is inspected for wear and tear before use.
☐	☐	Scaffolding and elevated platforms are equipped with guardrails and toe-boards.
☐	☐	Surface openings are barricaded, covered, or guarded. Caution tape is not a substitute for barricades. Exclusion zone is established beneath the work area.
☐	☐	Ladders are set on a firm base, correctly angled (4/1 ratio) and tied off.
☐	☐	100% tie off is used with full-body
☐		harness.
☐	☐	Anchor points are strong enough (5000 pounds per person)
☐	☐	Anchor points are high enough so that a fall will clear any obstructions.
	☐	A plan is in place to quickly rescue fallen or suspended employee(s).*

***DESCRIBE FALL RESCUE PLAN/METHODS**

Y	N/A	CONFINED SPACE CRITICAL CONTROLS
☐	☐	A "Confined Space Entry Permit" was fully completed and the entry supervisor had signed the permit certifying the space is safe for work prior to anyone entering the Permit Required Confined Space (PRCS).

Y	N/A	TRENCHING / EXCAVATIONS CRITICAL CONTROLS
☐	☐	A competent person assessed the soil, inspected the excavation, and engaged engineering and safety and health professionals as needed.
☐	☐	A trenching checklist was completed and the competent person certified the trench is safe for work prior to anyone entering the trench.

Y	N/A	LIFTING / RIGGING CRITICAL CONTROLS
☐	☐	Only qualified or certified crane operators, riggers and signalmen with the required experience for the lift are used.
☐	☐	All lifting devices and cranes are inspected prior to use.
☐	☐	A lift plan was conducted if: the lift exceeds 75% of the rated capacity at the configuration used, the lift requires the use of more than one crane, the lifting of personnel in a platform or basket, or any lift that presents special hazards or circumstances.
☐	☐	The weight of the load to be lifted was determined before selecting rigging equipment and rigging hardware.**
☐	☐	Non-conductive tag lines are used to guide loads.
☐	☐	Proper clearance, to include crane's full extension radius, is maintained when working near overhead power lines.
☐	☐	Pick-up, lay-down and crane operating areas are barricaded and secure.
☐	☐	There is proper space, ground conditions and outrigger deployment for mobile crane operations.
☐	☐	No one climbs on or walks under suspended loads

****LIST ITEMS AND WEIGHTS:**

ITEM: _____ **WEIGHT:** _____

ITEM: _____ **WEIGHT:** _____

ITEM: _____ **WEIGHT:** _____

Y	N/A	HOT WORK CRITICAL CONTROLS
☐	☐	If applicable, a "Hot Work Permit" was fully completed prior to anyone starting hot work.
☐	☐	Procedures for "Welding and Cutting on Tanks and Piping that Contain or Have Previously Held Flammable or Combustible Substances" is followed.

Y	N/A	ELECTRICAL CRITICAL CONTROLS
☐	☐	Only qualified electrical persons work on electrical systems.
☐	☐	Applicable arc-flash and PPE is worn by everyone involved in interactions with exposed energized parts.
☐	☐	Electrical equipment is properly De-energized/isolated, locked and tagged, tested, and grounded (if applicable).
☐	☐	Flagging, warning cones, and a spotter are used when working near overhead power lines.
☐	☐	Prior to performing underground work, utility providers are contacted to locate underground lines.
☐	☐	Grounding, bonding and transfer rate procedures are followed to prevent static accumulation and discharge during flammable material transfer operations.

Y	N/A	WORKING IN / AROUND WATER CRITICAL CONTROLS
☐	☐	Equipment is kept a safe distance back from the water's edge.
☐	☐	Handrails are provided around docks and work boats.
☐	☐	Roadways are properly bermed near water hazards.
☐	☐	Coast Guard approved Type I or Type V personal flotation device (PFD) are worn when working around water.

Y	N/A	OPERATION OF EQUIPMENT CRITICAL CONTROLS
☐	☐	Signage, caution lights, traffic cones, barricades or flaggers are used to control traffic in uncontrolled work areas.
☐	☐	Equipment horns of equipment working in the area are sounded prior to moving equipment to warn others of movement.

APPENDIX B: EXAMPLE CONFINED SPACE ENTRY PROGRAMS AND PERMITS

1. Confined Space Entry Permit
2. Confined Space Program
3. Confined Space Programs, Matrix, and Permit
4. Confined Space Entry & Exit Log and Permit

CONFINED SPACE ENTRY PERMIT Part 1: Work Details

SITE / LOCATION:				CONFINED SPACE:			
DATE:		TIME ISSUED:		TIME EXPIRED:		PERMIT NO.	

JOB DETAILS		PPE REQUIREMENTS
Work to be Completed (Details), Including Purpose of Entry:		   **Standard PPE that includes**: ▪ Hi-visibility clothing or safety vest ▪ Hardhats in accordance with company standards within designated areas ▪ Eye protection in accordance with company standards within designated areas ▪ Safety boots in accordance with company standards ▪ Hand protection specific to work to be conducted
Entry Supervisor Name:	**Entry Supervisor Signature:**	  **Additional SPF PPE that includes**: ☐ Respiratory protection: _____ ☐ Hearing protection in accordance with company standards within designated areas ☐ Fall protection in accordance with company standards ☐ Other: _____
Entry Attendant(s) Name(s):		
Authorized Entrant(s) Name(s):		
Equipment / Tool(s) to be Used:		

Note: A completed CSE Permit, and all other relevant documents, are kept at the entrance of the confined space during any CSE activities.

CONFINED SPACE ENTRY PERMIT Part 2: Assessment and Controls

Confined Space Entry Hazard Identification and Assessment								
Hazards			**Yes**	**No**	**Hazards**		**Yes**	**No**
Is there a hazardous or potentially hazardous atmosphere? Please record results of initial atmospheric testing below.			☐	☐	Is there a potential for engulfment or entrapment to occur?		☐	☐
Parameter	**Level(s) at Which Entry Can Occur**	**Initial Atmospheric Monitoring Results**			Are there sloping or converging walls or floors or other obstacles / space configurations that create a potential for the Entrants to be trapped / caught in the space?		☐	☐
Oxygen (O2)	**>19.5% → <23.5%**				Are there any other recognized hazards: (noise, heat, uncontrolled energy source, fall hazards inside the space, radiation, thermal exposure, etc.)? List these hazards and controls in the Hazard Assessment Section below.		☐	☐
LEL	**<10%**							
Carbon Monoxide (CO)	**<35ppm**							
Other:								
Initials of person sampling		Time of testing						
Date of equipment calibration		Test instrument and S/N						
If the answer to ALL four questions above is "No" – the space is classified as non-permit required for the work to be completed as specified in Part 1 of this Permit.								

Alternate Entry Procedure								
Hazards			**Yes**	**No**	**Hazards**		**Yes**	**No**
Does monitoring and inspection data show the only hazard is an actual or potential hazardous atmosphere?			☐	☐	If a hazardous atmosphere is identified, can it be made safe for entry using continuous forced air ventilation?		☐	☐
If the answer to BOTH questions above is "Yes" – the confined space entry activities, for the work to be completed as specified in Part 1 of this Permit, proceed with ONLY the controls specified in the Atmospheric Hazards and Monitoring Section below.								

Permit-Required Confined Space Entry Controls								
Existing Hazards (in addition to those identified above)		**Controls**			**Hazards Introduced From Work Being Performed**		**Controls**	
Requirements	**Yes**	**No**	**N/A**		**Requirements**	**Yes**	**No**	**N/A**

Is an emergency escape apparatus / retrieval system required and in place?	☐	☐	☐	Is intrinsically safe equipment required?	☐	☐	☐
All line(s) are capped / blanked / blinded?	☐	☐	☐	Adequate lighting is available?	☐	☐	☐
All required energy isolation is completed and verified?	☐	☐	☐	Flagging and barricading of the area(s) is completed?	☐	☐	☐
All equipment is depressurized, drained, cleaned and purged?	☐	☐	☐	Any additional required PPE is in use? Specify:	☐	☐	☐
Entry Supervisor communication method / equipment is identified and implanted?	☐	☐	☐	Communication method / equipment is implemented between Entry attendant and Entrant?	☐	☐	☐
Emergency response communication method is in place and in working order?	☐	☐	☐	Pre-entry meeting and review is completed, including training verification?	☐	☐	☐
Are acceptable entry conditions met and Entry Supervisor is in agreement?	☐	☐	☐	Is a third-party rescue team onsite?	☐	☐	☐
	☐	☐	☐		☐	☐	☐

Permit-Required Entrant(s) Monitoring

Name	In	Out	In	Out	In	Out	In	Out

Atmospheric Hazard Control and Monitoring							
Requirements	**Yes**	**No**	**N/A**	**Requirements**	**Yes**	**No**	**N/A**
Is ventilation required and installed? Type: Duration	☐	☐	☐	Is continuous monitoring required?	☐	☐	☐

Before personnel enter the confined space, the atmospheric monitoring for O_2, CO, and LEL are conducted. Any mechanical ventilation is shutdown for at least 15 minutes prior to testing and atmospheric monitoring is conducted at least every 2 hours when personnel are in the confined space, or if the confined space has been vacant for more than 2 hours.

Parameter	Level(s) at Which Entry Can Occur	Pre-Entry Results	Results Time: _____	Results Time: _____	Results Time: _____	Results Time: _____	Results Time: _____	Results Time: _____	Results Time: _____
Oxygen (O2)	>19.5% → <23.5%								
LEL	<10%								
Carbon Monoxide (CO)	<35ppm								
Other:	< PEL / TLV / OEL: ___								
Other:	< PEL / TLV / OEL: ___								

CONFINED SPACE ENTRY PERMIT Part 3: Authorization, Issuance, and Closeout

Permit Control			
This Permit is Valid From:		**Permit is Valid Until:**	
Date	**Time**	**Date**	**Time**

ISSUED: I authorize the above work to be carried out, subject to the conditions shown.

SIGNED **(ENTRY SUPERVISOR) Print Name:**

ACCEPTANCE: I hereby declare that I understand the work to be carried out, the hazards involved, and the precautions required. I also confirm that all the permit requirements and information has been explained to all workers involved.

SIGNED **(PERSON TO WHOM PERMIT ISSUED) Print Name:**

If the person the permit is issued to has to leave the work, then the job stops and not restart until a hand over has taken place. This will require a full review of the permit and controls and the issue of a new permit. The current permit is handed back and cancelled

PERMIT EXTENSION: If the work runs over the stated time then the work stops. The person who issued the permit may extend the time after reassessing that all the necessary controls are in place or alternatively issue a new Permit following the full procedure. The Permit can only be re-issued twice and only if there has been no significant time lapse. If work has stopped and the area left unattended (i.e. end of working day and re-started the next day) then this permit cannot be re-issued.

Permit is Valid from:		**Permit is Valid Until:**	
1 – Extended Date	**1 – Extended Time**	**2 – Extended Date**	**2 – Extended Time**

SIGNED_____**(ENTRY SUPERVISOR) – 1st EXTENSION**

SIGNED_____**(ENTRY SUPERVISOR)- 2nd EXTENSION**

SIGN OFF: I hereby declare that the work detailed in this permit has been left in a safe manner and all men under my charge have been withdrawn. The space has been left in a safe condition and all safety devices replaced, the site is now ready for testing and operation* The work has not been completed and more work remains to be done under a new Permit to Work*

*** DELETE AS APPLICABLE**

SIGNED_____**(PERSON TO WHOM PERMIT ISSUED)**

Date		**Time**	

CLOSEOUT: I hereby declare that this permit and all copies of it are closed. No further work shall be undertaken on the permitted job prior to the issue of a new permit.

The site has been left in a safe condition ready for operation *

The site has been suitably isolated to remove any risk *

***DELETE AS APPLICABLE**

SIGNED **(ENTRY SUPERVISOR)**

Date		**Time**	

Key Contacts (To be contacted if unusual circumstances arise)	Name	Position	Contact No.
	Emergency Services	Police, Fire, Ambulance	911

CONFINED SPACE SURVEY AND INVENTORY - SAMPLE

Permit Required Confined Space(s)			
Area Name	Description	Identifying Details	Comments
Non-Permit Required Confined Space(s)			
Area Name	Description	Identifying Details	Comments

Policy

Entry into confined spaces by workers is necessary at times for the operation of facilities. It is well known that entry into such confined spaces present a potential hazard to the worker, therefore, this policyshall be adhered to when any person enters a confined space.

In addition to the preparations and precautions taken prior to entry into a confined space, the worker shall also conduct a thorough hazard assessment using the SLAM Risks procedure to identify and manage other hazards that may be present in the work area.

A confined space is a space which:

a) Is large enough and so configured that an employee can enter;
b) Has limited or restricted means for ingress (entry) or egress (exit); and
c) Is not designed for continuous occupancy.

All bins, hoppers, silos, material handling equipment, or other spaces that meet the confined space defining criteria above shall be labeled with signage identifying them as confined spaces. Example Signage:

Danger – Confined Space – No Unauthorized Entry

Exhibits

Exhibit H1-1: Confined Space Permit
Exhibit H1-2: Confined Space Matrix
Exhibit H1-3: Confined Space Survey
Exhibit H1-4: Confined Space Rescue Evaluation

References

United States: OSHA 29 CFR 1910. 146
MSHA 30 CFR 56/57.15005
National Fire Protection Association (NFPA) standard 70E
Canada: Ontario – Occupational Health and Safety Act, R.S.O. 1990, c. O.1; R.R.O. 1990
Ontario – O. Reg. 632/05: Confined Spaces
Quebec – S-2.1 Act respecting occupational health and safety
Mexico: The Mexican Federal Labor Law

Components

Procedures

1.0 Responsibility

1.1 Each facility manager or their designee is responsible for developing and implementing site-specific procedures consistent with the requirements of Confined Space Program.

1.2 A survey of all confined spaces shall be documented using Exhibit H1-3 and maintained as part of the site-specific confined space program.

1.3 All contractors who are required to enter confined spaces on property shall be approvedfor such work through Contractor Management Program. All contractors shall be advised of all hazards associated with the site-specific confined space program and shall complywith all other requirements of safety and health policies and procedures.

2.0 Mandatory Entry Requirements for Typical Entries

2.1 **Permits** - Prior to entering any confined space, authority shall be obtained from supervision by means of a signed entry permit. Entry permits should be maintained for one year. See Exhibit H1-1.

2.2 Permits shall be cancelled by the issuing supervisor at the end of the entry or the end of the shift in which the permit was issued. If the entry is required to extend beyond the end of the initial shift, a new permit will be issued by the on-coming shift supervisor.

2.3 Entry permits will be posted at the confined space.

2.4 Entry permits will be terminated if hazardous atmospheric conditions develop or if any incident indicates hazards have not been adequately addressed. Workers will be ordered to evacuate. The reasons for termination will be documented on the permit. A new permit will be issued to authorize entry when the hazardous condition is corrected, and acceptable entry conditions can be maintained for the duration of the work.

2.5 **Pre-Entry**

2.5.1 A pre-job briefing covering the requirements of this procedure shall be performed by the supervisor in charge of the job before each confined space entry. Potential hazards to include, but not limited to: physical, electrical, chemical, mechanical, oxygen deficiency, explosive limits, entrapment, engulfment, etc. shall be assessed during the pre-job briefing.

2.5.2 Supervisors are responsible;

2.5.2.1 For knowing the hazards of the space and the potential outcomes of those hazards and control measures to ensure safe entry;

2.5.2.2 For emergency plans and procedures specific to the space;

2.5.2.3 For terminating and canceling permits when the entry is completed, or conditions change;

2.5.2.4 To verify rescue services are available;

2.5.2.5 To ensure the entry proceeds within allowable conditions, and stop the entry if conditions warrant.

2.6 When permission has been obtained from supervision and the pre-job briefing has been completed, a signed entry permit listing all authorized entrants and authorized attendants shall be posted at the opening to the space. It may be possible at times that authorized entrants and

authorized attendants switch duties during the task(s) being conducted in the confined space. When this situation is planned or anticipated the entry permit shall contain the names of all competent and authorized workers involved.

2.7 Duties of Attendants - At least one attendant will be stationed outside the confined space for the duration of entry.

2.7.1 Attendant duties are as follows:

2.7.1.1 Knows the hazards of the confined space and the signs and symptoms of exposure.

2.7.1.2 Knows the behavioral effects of exposure.

2.7.1.3 Keeps an accurate count and identifies who is in the space.

2.7.1.4 Remains outside the space until relieved by another attendant.

2.7.1.5 Communicates with authorized entrants as necessary, monitors status, gives exit order.

2.7.1.6 Monitors activities inside and outside the space to determine if it is safe to remain inside.

2.7.2 Issues evacuation orders:

2.7.2.1 If behavioral effects of exposure are observed.

2.7.2.2 If a condition outside can endanger entrants in the space.

2.7.2.3 If attendant cannot effectively and safely perform all the assigned duties.

2.7.3 Summons rescue and emergency services if entrant(s) need help in escaping.

2.7.4 Takes the following actions if unauthorized persons approach or enter:

2.7.4.1 Issues warning to stay away.

2.7.4.2 Tells unauthorized person to exit if the space has been entered.

2.7.4.3 Informs the authorized entrants and supervisor of unauthorized entry.

2.7.5 Performs non-entry rescues as specified in the rescue plan.

2.7.6 Performs no duties that might interfere with the primary duty to monitor and protect.

2.7.7 Never enters a confined space to make a rescue unless relieved by another attendant and has the necessary PPE to perform the rescue safely.

2.7.8 Keeps equipment available to make a rescue even though it may never be needed.

2.8 Duties of Entrants - The duties of persons entering confined spaces are as follows:

2.8.1 Know the hazards faced during entry including signs, symptoms and effects of exposure.

2.8.2 Use equipment properly and obey all entry procedures.

2.8.3 Communicate with attendant so status will be known.

2.8.4 Alert attendant if recognized symptoms or signs of exposure or if danger is detected.

2.8.5 Exit space if danger is detected or if ordered by attendant or entry supervisor.

2.8.6 Exit if evacuation alarm is sounded.

2.9 Elimination of Physical Hazards

2.9.1 All openings that offer potential for falls into confined spaces will be properly barricaded. Barriers will also protect against tools and materials dropping into confined spaces.

2.9.2 If ladders are used for entry and exit, they will be secured to prevent movement and falls.

2.9.3 Tripping hazards inside confined spaces and at entry and exit points will be eliminated.

2.9.4 Pumps, generators and compressors, which have potential to generate carbon monoxide, will be located sufficient distance and downwind from confined spaces to prevent atmospheric hazards.

2.9.5 Confined spaces will be cleaned by washing, neutralizing and purging to eliminate harmful, toxic or flammable materials, gases, and vapors. Spaces containing flammable vapors or gases will not be entered for any reason. Because inert gas purging can create oxygen deficiency, oxygen level testing and forced ventilation must be used afterpurging to ensure the space is safe for entry.

2.9.5.1 Piping will be isolated by one of these methods:

2.9.5.1.1 A blank is inserted in the line.

2.9.5.1.2 Use of a double block and bleed.

2.9.5.1.3 Lines disconnected and misalign to prevent entry of liquids, vapors or gases.

2.9.6 Energy Isolation (Lockout/Tagout/Tryout) procedures will be observed to prevent the inadvertent start-up of affected equipment and machinery and a zero-energy state must be achieved with the chosen method of lockout and according to site-specific Energy Isolation Plans.

2.9.7 Entrants shall blank (if possible) and lock-out (mandatory) all feed and discharge equipment, lines, etc. associated with the confined space.

2.9.8 All electrically supplied equipment entering the space (lighting, tools, etc.) shall be equipped with Ground Fault Circuit Interrupters (GFCI) unless they are double insulated. Portable lights should have bulbs enclosed to prevent bulb exposure. Low voltage lighting systems will be used as needed.

2.9.9 Only explosion proof electrical equipment including exhaust blowers and portable lights will be used in confined areas when there is potential for flammable vapors or gases.

2.9.10 Non-sparking tools will be used to open covers of tanks that have potential to contain flammable vapors and gases.

2.10 Authorized entrants shall be provided appropriate respiratory protection for use depending on site-specific conditions.

2.11 Adequate lighting shall be provided within the space for the duration of the entry.

2.12 Ventilation and Atmospheric Testing

2.12.1 Proper ventilation and an air supply free of contaminants must be maintained for the duration of entry operations.

2.12.2 Mechanical ventilation systems will be set up to provide outside air.

2.12.3 Atmospheric testing using a calibrated direct-reading instrument for oxygen deficiency, Lower Explosive Limits (LEL) or other applicable toxin shall be performed by a competent person before entry and during occupancy of the space.

2.12.3.1 The proper order of testing is (1) Oxygen, (2) explosive gases (LEL), and (3) applicable toxins (e.g., solvent or adhesive vapors).

2.12.3.2 Employees are prohibited to enter a confined space if the oxygen content is determined to be less than 19.5 percent or greater than 22.0 percent.

2.12.3.3 During welding or cutting tasks inside a confined space, the atmosphere will be continuously monitored.

2.12.3.4 Plants will determine the frequency of the additional periodic tests and results of pre-entry atmospheric and subsequent monitoring shall be recorded on the entry-permit.

2.12.4 Entry will be prohibited until hazards are eliminated and re-testing verifies it is safe.

2.12.5 Persons conducting tests must be trained and competent in the use and calibration of test instruments and in the documentation of calibration and tests results.

2.12.5.1 Atmospheric testing equipment shall be calibrated according to OEM recommendations.

2.12.5.2 Atmospheric testing equipment shall be "bump" tested prior to each use. A bump test requires the testing equipment to be exposed to a known concentration of gas to ensure sensors are working properly.

2.12.6 Any reading above or below the normal levels during a confined space entry will terminate the permit.

2.12.7 The authorized entrant or that employee's authorized representative shall be allowed to observe any monitoring or testing of confined spaces and shall immediately be provided with the results. They may also request a re-evaluation of that space.

2.13 A simplified matrix identifying common confined spaces encountered throughout is attached as Exhibit H1-2 and helps to quickly identify confined space entry requirements for specific entry types.

3.0 Mandatory Entry Requirements for Welding and Cutting

3.1 The following specifications are applicable to situations in which welding is to be performed inside the confined space.

3.2 All requirements specified in Section 2.0 shall be adhered to, as well as:

3.2.1 Fire extinguishers shall be located in the space.

3.2.2 Temporary ventilation shall be provided to the space.

3.2.3 All authorized entrants shall utilize powered-air purifying respirators (PAPR) or full-face respirators unless engineering or administrative controls have been implemented and verified to adequately control exposure to metals contained within welding fume.

3.3 Welding or cutting will not be performed in or on vessels that have contained flammable or combustible products unless performed by qualified outside contractors.

3.4 Methods to make vessels safe must address the potential for products to release flammable vapors, and the danger of residue releasing flammable vapors when the vessel is heated by welding or cutting.

3.5 Torches and hoses will be removed from confined spaces when not actually being used. Keep them outside the confined space whenever possible.

3.6 Inert gas welding will not be done in or near confined spaces since the gases used in these welding processes are heavier than air and can displace it to create oxygen deficiency.

3.7 To control toxic exposures, coatings will be cleaned 4" from areas to be welded or heated.

4.0 Mandatory Requirements for Chemical or Other Toxins

4.1 The following specifications are applicable to situations in which exposure to chemical vapors or other toxins is possible inside the confined space.

4.2 All requirements specified in Sections 2.0 and 3.0 shall be adhered to as well as:

4.2.1 While a person (s) is occupying the confined space, there shall be at least one attendant outside of the space who shall:
4.2.1.1 Neither leave the opening nor enter the space for any reason, including rescue;
4.2.1.2 Keep in communication with authorized entrants at all times the space is occupied; and
4.2.1.3 Order the evacuation of the space should conditions inside or outside warrant;
4.2.2 The attendant shall at all times have a means of summoning assistance (communication system) if an emergency should occur; and
4.2.3 Have no assigned duties that interfere with the ability to monitor the space.

4.3 Substances that can create a hazardous atmosphere should not be used in confined spaces, but where this cannot be avoided; workers must receive training on the hazards and how to avoid them.

5.0 Entry into Material/Product Bins, Silos or Tanks

5.1 The following procedure is applicable to entries into raw material or finished product bins, silos or tanks for cleaning, unplugging, or other operations.

5.2 Material that offers potential for caving or sliding must be barred down from the top before entry is permitted.

5.3 The requirements specified in Section 2.0 shall be adhered to, as well as:
5.3.1 Entrant removal equipment shall be set-up at the opening to the space. This equipment shall be equipped with fall arrest capabilities.
5.3.2 For vertical entries, entrants shall be attached to the removal equipment via full body harness and lifeline of not less than 1/2" minimum thickness that is free of knots, cuts, frays or other defects that may interfere with proper operation of the device.
5.3.3 For horizontal entries the entrant shall be equipped with a lifeline attached via full body harness and lifeline of not less than 1/2" minimum thickness that is free of knots, cuts, frays or other defects that may interfere with proper operation of the device.

5.4 While a person (s) is occupying the confined space, there shall be at least one attendant outside of the space who shall;
5.4.1 Not leave the opening, nor enter the space for any reason, including rescue;
5.4.2 Keep in communication with entrants at all times while the space is occupied;
5.4.3 Order the evacuation of the space should conditions inside or outside warrant;
5.4.4 The attendant shall at all times have a means of summoning assistance (communication system) if an emergency should occur.
5.4.5 And, have no assigned duties that interfere with the ability to monitor the space.

6.0 Entry into Grinding Mills

6.1 This section governs the entry of personnel into grinding mills for inspection or repairs of linings, cracks, shell thickness deficiencies, etc.

6.2 All requirements specified in Section 2.0 shall be adhered to, as well as:
6.2.1 For brick lined mills, bricks and supporting structures immediately above the work area of the entrants shall be shored to prevent collapse of the same.

7.0 Entry into Dryers

7.1 This section governs the entry of personnel into dryers for inspection or repair of lifters, liners, cracks, shell thickness deficiencies, etc.

7.2 All requirements specified in Sections 2.0 and 4.0, with the possible exception of 2.7 and 4.2 (duties of attendant), shall be adhered to. If site conditions permit exclusion of 2.7 and 4.2 from this section, a schedule of periodic checks (i.e. every 15, 30, 45, etc. minutes) by supervision shall be established with the authorized entrants and recorded on the permit.

7.3 Dryers shall be shut down and given adequate time to cool off before entry is attempted.

7.4 Dust collection equipment shall be turned on for a minimum of 10 minutes before entry is made to assure adequate purging of the space.

7.5 All fuel feed lines to the dryer shall be closed and locked-out.

7.6 When entering fluid bed dryers through the plenum, steel grating, liners and supporting structures shall be shored to prevent collapse of the same during the work project.

8.0 Entry into Hoppers

8.1 This section governs the entry of personnel into material hoppers for unplugging, cleaning, repairing, modifying, chute repairs, etc.

8.2 All requirements specified in Section 2.0 shall be adhered to.

8.3 When the hopper involved is related to ore trucks, loaders, scrapers, etc., the supervisor in charge of the entry work shall advise the operators of the above equipment and assure that access areas to the hopper are physically barricaded by means of signs, ropes, barrels, etc.

9.0 Entry into Railcars

9.1 This section governs the entry of personnel into railcars.

9.2 All requirements of Section 2.0 shall be adhered to in addition to the following:

9.2.1 All top and hatches will be in the open position to maximize ventilation within the interior of the railcar.

9.2.2 Confined space rescue equipment (e.g. Rolgliss or equivalent device) shall be utilized to lower and retrieve an employee into the railcar via a full body harness (safety belts are not permissible for confined space entry purposes).

9.2.3 The handbrake and wheels of the railcar shall be secured and chocked (30 CFR Part 56.9302) respectively prior to entry.

9.3 As part of the pre-job briefing, the entrant must advise their supervisor and all department employees that they are going to make entry into the railcar and for what purpose. The identity and location of the railcar to be entered shall also be communicated to the supervisor and department employees in order to take all reasonable precautions.

10.0 Emergency and Rescue

10.1 **Rescue Planning and Procedures – External:** Rescue and emergency services must be provided, or arrangements made with an outside service. Exhibit H1-4 Confined Space Rescue Evaluation shall be completed to determine external response capabilities and compliance with confined space rescue.

10.2 **Rescue Planning and Procedures – Internal:** Rescue and emergency services provided by employees shall take the following measures:

10.2.1 A rescue plan will address summoning rescue and emergency services, the rescue, providing emergency services to rescued workers, and preventing unauthorized workers from attempting a rescue.

10.2.2 Personal protective equipment shall be provided, and workers shall be trained in its use.

10.2.3 Workers shall be trained in assigned rescue duties.

10.2.4 At least one member of the rescue team will hold a current certification in first aid and CPR.

10.2.5 Rescue plans, outlining the methods and procedures for getting help and performing rescue operations will be in effect for every confined space entry.

10.2.6 Entry will not occur until all required equipment is staged at the entry site, is checked for serviceability, and rescue workers are trained in its use.

10.3 Emergency and Rescue Equipment - Equipment for rescue from confined spaces will include:

10.3.1 A full body harness and lifeline for each entrant with the free end attached to a mechanical device or fixed point outside the confined space. Lines are attached in the center of the back at shoulder level or above the head. If the vertical retrieval depth is more than 5 feet a mechanical device shall be made available.

10.3.2 At least one spare harness and lifeline depending on the number of rescuers.

10.3.3 Hoisting system to facilitate vertical removal from the confined space.

10.3.4 Clear communication lines (cell phones and/or two-way radios) for attendant to summon help and to communicate with entrants.

10.3.5 All Safety Data Sheets for chemicals used in the confined space shall be available

11.0 Training

11.1 Training must specifically document general Confined Space procedures and Site-Specific Procedures including Site-Specific rescue.

11.2 Every worker will be informed about the location and dangers of confined spaces and that unauthorized entry is prohibited.

11.3 Workers involved in the Confined Space Program will acquire the understanding, knowledge, and skills necessary for the safe performance of their assigned duties.

11.4 Affected workers (entrants, attendees, rescue personnel) will be trained: initially for assigned duties; whenever there is a change in confined space operations that presents a hazard about which a worker has not previously been trained; whenever there is reason to believe there are deviations or inadequacies in procedures; and will receive annual refresher training.

11.5 A confined space rescue drill will be completed annually.

11.6 The training shall be documented.

	Confined Space Matrix	Revision Level:
Initiated by:	Section: **Exhibit H1-2**	Page **1 of 1**

ALL CONFINED SPACES TO BE LABELLED DANGER - CONFINED SPACE - NO UNAUTHORIZED ENTRY

Confined Space Minimum Requirements	Pre-Job Meeting	Signed Entry Permit	Blank/Lockout Feed & Discharge	Barricade Openings	Ambient Air Ventilation Provided	GFCI or Electrical Equip. Dbl. Insulated	Rescue Workers/Equipment on Stand-By	Respiratory Equipment	Adequate Lighting	Powered Air Purifying Respirator (PAPR) or Full-Face Respirator	Fire Extinguisher in Space	Temporary Ventilation to Space	Atmospheric Testing for Oxygen & LEL, others	Record of Atmospheric Testing on Entry Permit	Attendant on Duty WITH Communications	Entrant Removal Equipment w/harness	Brick Lined Mills & Equipment Shored Up	Dryer Shutdown and Cooled	Dust Collection needs to Purge Space 10 min.	Dryer Fuel Feed Lines Closed & Locked-Out	When Entering Fluid Bed Dryer thru Plenum, all Structures Shored-Up	All Hatches Open, if possible, for Ventilation	Railcar Wheels Chocked - Brake Set
Typical Confined Space Entries with NO Additional Hazards	X	X	X	X	X	X	X	X	X				X	X	X								
Welding/Cutting Inside Space	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
Chemical or Other Toxins in the Space	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
Material/Product Bins, Silos or Tanks	X	X	X	X	X	X	X	X	X				X	X	X	X							
Welding in Bins, Silos, Tanks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
Chemicals, Other Toxins in Bins, Silos, Tanks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
Entry Inside Grinding Mills	X	X	X	X	X	X	X	X	X				X	X	X		X						
Welding Inside Grinding Mills	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X						
Chemicals or Other Toxins in Grinding Mills	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X						
Entry into Dryers	X	X	X	X	X	X	X	X	X				X	X	X-1			X	X	X	X		
Welding in Dryers	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X-1			X	X	X	X		
Dryers with Chemicals or Other Toxins	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X-1			X	X	X	X		
Entry into Hoppers	X	X	X	X	X	X	X	X	X				X	X	X-2								
Welding in Hoppers	X	X	X	X	X	X	X	X	X	X	X	X-3	X	X	X-2								
Chemicals or Other Toxins in Hoppers	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
Entry into Railcars	X	X	X	X	X	X	X	X	X				X	X	X	X						X	X

X-1 Site conditions may permit exclusion of this requirement, however, a schedule of periodic checks (i.e., every 15, 30, 45, etc. min.) by supervision shall be established with the authorized entrants.

X-2 When the hopper involved is related to ore trucks, loaders, scrapers, etc., the supervisor in charge of the entry work shall advise the operator of the above equipment and assure that access areas to the hoppers are physically blocked off by means of signs, ropes, barrels, etc.

X-3 Site conditions may exclude this requirement if the space has adequate ventilation, and development of fumes is not possible.

Confined Space Entry Permit

To be posted at the confined space entrance during entry

Confined Space Location/Name:	Permit Issue Date & Time:
Work to be Performed:	Permit Expiration Date & Time:
Hot Work? ☐ Y ☐ N If yes, complete Hot Work Permit in addition to Confined Space Permit	

Supervisor in Charge:

Name(s) of Entrant(s):

Name(s) of Attendant(s):

Rescue / Standby Personnel #1:	Rescue / Standby Personnel #2:

Rescue Procedures

Listed in Preferred Order

1. Self-Rescue (Ladder, etc.)
2. Non-Entry Rescue (Retrieval system, Tripod & Winch, e.g.)
3. Entry Rescue **CALL 911!**

Rescue Equipment

- ☐ Rescue SKED board
- ☐ Tripod
- ☐ Ladder
- ☐ Davit arm
- ☐ Full body harness
- ☐ Wristlets
- ☐ Lifeline
- ☐ Rope & pulley system
- ☐ Winch
- ☐ Self-retracting lanyard
- ☐ Davit arm mount/base
- ☐ Bosun chair
- ☐ Rescue team (on-standby)
- ☐ Other:

Typical Hazards

- ☐ Oxygen deficiency
- ☐ Oxygen enrichment
- ☐ Flammable gas/vapors
- ☐ Dust
- ☐ Toxic gases, vapors, fumes, etc.
- ☐ Engulfment (by liquid or solid)
- ☐ Entrapment
- ☐ Mechanical hazards
- ☐ Electrical hazards
- ☐ Biological hazards (insects, waste, pathogens)
- ☐ Noise
- ☐ Heat/cold
- ☐ Hazardous materials/chemicals
- ☐ Vehicle traffic
- ☐ Adjacent work activities
- ☐ Welding (UV light, gases, etc.)
- ☐ Other:

Entry Procedures/ Equipment

- ☐ Ventilation/Purging eqpt.
- ☐ Portable ladders
- ☐ Barriers
- ☐ Guarded openings
- ☐ Radios
- ☐ Lighting / Illumination
- ☐ SDS at work site
- ☐ Locks & tags (LOTOTO)
- ☐ Blocking / Securing
- ☐ GFCI equipment
- ☐ Traffic barricades
- ☐ Portable eye wash
- ☐ Cleaning / Pressure Washers / Vac Truck
- ☐ Grounding / Bonding
- ☐ Explosion proof lights
- ☐ Spark resistant tools
- ☐ Other:

Personal Protective Equipment

- ☐ Hard hat
- ☐ Safety footwear
- ☐ Safety glasses
- ☐ Air purifying respirator
  - ☐ PAPR ☐ Half-mask
- ☐ Hearing protection
- ☐ Face shield
- ☐ Goggles
- ☐ Leather gloves
- ☐ Rubber / Nitrile gloves
- ☐ Full body harness with lanyard
- ☐ Cooling vests
- ☐ Knee pads / Elbow pads
- ☐ Tyvek suit / Chemical resistant suit
- ☐ Other:

Pre-Entry Checklist

☒ As completed

N/A	YES	
❑	❑	Initial air test completed
❑	❑	Double block & bled
❑	❑	Piping blanked or disconnected & valves closed and secured
❑	❑	Energy sources locked out
❑	❑	Mechanical hazards secured or blocked from movement

Confined Space Entry Permit

To be posted at the confined space entrance during entry

Pre-Entry Checklist ☒ As completed

N/A	YES	
❑	❑	Residual energy released
❑	❑	System tested to ensure fully locked out
❑	❑	Atmosphere purged, or ventilation utilized
❑	❑	Emergency rescue procedures established
❑	❑	Emergency rescue equipment set up at point of entry
❑	❑	Personal protective equipment issued and worn
❑	❑	Checklist and safe work procedures reviewed with Entrants
❑	❑	Checklist and safe work procedures reviewed with Entry Attendant

Special Instructions / Comments:

Atmospheric Testing

Instrument Name	Type	Model #	Serial #	Calibrated?	Calibration Date
				☐ Y ☐ N	

Parameter Record every hour	Permissible	Sampler Initials	Initial Reading	Time	Reading	Time	Reading	Time	Reading	Time
% Oxygen	19.5% - 23%									
% LEL	< 10%									
Carbon Monoxide	25 ppm									
Hydrogen Sulfide	10 ppm									
Parameter Record every hour	**Permissible**	**Initials**	**Reading**	**Time**	**Reading**	**Time**	**Reading**	**Time**	**Reading**	**Time**
% Oxygen	19.5% - 23%									
% LEL	< 10%									
Carbon Monoxide	25 ppm									
Hydrogen Sulfide	10 ppm									

Authorization of Entry

Confined Space Supervisor Signature:
(Open Confined Space Entry Permit) Time:

Confined Space Supervisor Signature:
(Closing Confined Space Entry Permit) Time:

Forward completed forms to Safety Department

APPENDIX C: EXAMPLE ENERGY ISOLATION PROGRAMS AND PERMITS

1. **Energy Isolation Electrical Program and Permit**
2. **Lock Out Tag Out Try Out Procedure**
3. **Lockout/Tag-Out Procedure**

Policy

The purpose of this policy is to prevent injury to or independent contractor personnel. Procedures detailed in this policy encompass an Energy Isolation Program and supported by a Life Saving Rule.

Procedures shall be used to ensure that the machine, equipment and/or system is isolated from all potentially hazardous energy, as well as locked-out and/or tagged-out and tested before personnel perform any servicing or maintenance activities where the unexpected energized, start-up or release of stored energy could cause personal injury.

In addition to following procedures included in this policy, all workers engaged in work involving energy sources are required to conduct a Job Hazard Analysis (JHA) as well as a Last-Minute Risk Assessment (LMRA) on each task in which they are involved.

No plant or equipment may be worked upon unless all energy sources, to include kinetic energy, potential energy, pressure, electrical energy, thermal energy or chemicals, have been effectively isolated, locked-out, tagged-out and tested in accordance with an Energy Isolation Plan, or in accordance with the live work process.

Facility managers must review plant and equipment that is frequently required to be isolated and assess the benefit of installing local isolation means if local disconnects do not already exist. Where local isolation is not available, isolation must occur at the next available lockable isolation point regardless of the impact of this on other equipment or facility operations. If no convenient isolation point can be identified, the isolation must occur at the main energy source (i.e. the motor control center).

Exhibits

Exhibit I1-1: Site Specific Survey
Exhibit I1-2: Multiple Source Procedures
Exhibit I1-3: Electrical Permit
Exhibit I1-4: Energy Isolation Checklist
Energy Isolation Life Saving Rule

References

United States: OSHA 29 CFR 1910.147 & 1910.119 MSHA 30 CFR 56/57.12000
National Fire Protection Association (NFPA) standard 70E “Electrical Safety in the Workplace, 2018 Edition”
Canada: Occupational Health and Safety Act, R.S.O. 1990, c. O.1; R.R.O. 1990, Reg. 851: INDUSTRIAL ESTABLISHMENTS and/or R.R.O. 1990, Reg. 854: MINES AND MINING PLANTS as applicable
Mexico: The Mexican Federal Labor Law

Components

Procedures

1.0 Energy Isolation Plan

1.1 Every site must prepare an Isolation Plan for each individual piece of equipment that has the potential for the uncontrolled release of energy.

1.2 Isolation Plans must be approved by the facility manager or their designee as having been tested prior to use.

1.3 The Energy Isolation Plan must identify the specific elements of each piece of equipment that will require isolation, the form(s) of energy associated with each, and specify:

1.3.1 Sources of energy;

1.3.2 Isolation locations;

1.3.3 Method of isolation;

1.3.4 Tagging methods; and

1.3.5 Method of effectively testing that the equipment cannot be re-energized. The energy isolation plans are to be documented via the Brady Lockout Writer software package or utilizing Exhibit I1-1: Site Specific Survey until the Brady system is activated.

1.4 Equipment must be labelled with a unique identifier to facilitate the correct identification of items that must be isolated and de-energized.

1.5 The Energy Isolation Plan must be updated when equipment or processes change ensuring the plan is always current.

1.6 The Energy Isolation Plan must be readily available to anyone who may need to work on equipment.

2.0 Definitions

2.1 **De-energizing** – Isolation and removal of residual energy from the equipment to be worked on (e.g., release or removal of kinetic energy, pressure, electrical energy, heat or chemicals).

2.2 **Effective Isolation** – The energy source has been isolated, locked and tagged and the isolation is proved to be effective by testing.

2.3 **Energy Isolation Plan** – A plan developed by a competent worker for each piece of plant and equipment that has the potential of uncontrolled release of energy. Energy Isolation plans are to be created using the Brady Lockout Writer software package.

2.4 **Group Lockout** – A lockout that occurs when more than one individual will be performing maintenance on a single piece of equipment simultaneously with one authorized individual that is in charge of the entire group lockout.

2.5 **Isolation** – The separation of equipment or circuits from energy sources.

2.6 **Limited Approach Distance** – An approach limit at a distance from an exposed energized electrical conductor or circuit part within which a shock hazard exists.

2.7 **Prohibited Approach Distance** – An approach limit at a distance from an exposed energized electrical conductor or circuit part within which there is an increased risk of shock, due to electrical arc-over combined with inadvertent movement, for personnel working in close proximity to the energized electrical conductor or circuit part.

2.8 **Restricted Approach Distance** – An approach limit at a distance from an exposed energized electrical conductor or circuit part within which work is considered the same as making contact with the electrical conductor or circuit part.

2.9 **Unique Lock** – A lock allocated to an individual, with a single unique key.

3.0 Training Requirements

3.1 **Safety Training**. The training requirements contained in this section shall apply to personnel who face a risk of injury while performing their assigned duties that require the isolation of energy sources, those who supervise personnel who face a risk of injury from arc flash, and plant management (managers and superintendents). ALL safety training shall be documented. Such personnel shall be trained to:

3.1.1 Understand the restrictions of working on energized equipment;

3.1.2 Be capable of identifying all energy sources present on each piece of equipment and the control techniques necessary to ensure a safe working environment;

3.1.3 Understand techniques to differentiate between energized and non-energized components, determine their nominal voltage (for electrical energy), and use appropriate clearance distances;

3.1.4 Be familiar with methods of shock protection including the use of approach distances, insulating and shielding materials;

3.1.5 Realize the hazards of an arc flash/blast event;

3.1.6 Be able to determine the hazard/risk category and proper PPE for arc flash protection;

3.1.7 Understand the need to care for and inspect safety equipment prior to use.

3.2 **Refresher training** in safety-related work practices and applicable change in NFPA 70E shall be performed at intervals not to exceed 3 years.

3.3 **Emergency Procedures**. Personnel working on or near exposed energized electrical conductors or circuit parts shall be trained in methods of release of victims from contact with exposed energized conductors or circuit parts. Training will also include information on how to respond to a downed high voltage transmission line caused by either mobile equipment or severe weather and proper responses for other energy sources. Refresher training with respect to emergency procedures shall occur annually.

3.4 **Competent Worker**. A competent worker, as designated by the facility manager, is a worker who has, through a combination of training, education and experience, acquired knowledge and skills that enable them to perform work in accordance with the requirements specified in this policy and procedure:

To be deemed “competent” by a facility manager, a worker must possess the following:

3.4.1 The ability to effectively identify all sources of energy associated with the equipment to be worked on;

3.4.2 The ability to identify the controls necessary for managing the risks posed by the identified forms of energy; and

3.4.3 The ability to implement controls necessary for mitigating the risks posed by the forms of energy identified.

3.5 **Qualified Worker**. A worker who carries a license, journeyman certification, an industrial electrician certificate, (or equivalent), or has completed a plant electrical apprentice program is typically considered both “competent” and “qualified”. However, all personnel must provide requisite electrical safe work practice training records for the scope-of-work being undertaken in order to be considered “qualified”. The site must maintain up-to-date documentation indicating that the qualified worker has successfully completed the required electrical qualifications and has demonstrated competency in safe electrical work practices. An individual who is undergoing on-the-job training for the purpose of obtaining the skills and

knowledge necessary to be considered a qualified worker and who, in the course of such training, has demonstrated an ability to perform specific duties safely at his or her level of training, and who is under the direct supervision of a qualified worker, shall be considered to be a qualified worker for the performance of those specific duties.

For work involving electrical energy, only individuals possessing the following skills will be deemed qualified by the facility manager to perform electrical related work:

3.5.1 To distinguish exposed live electrical parts from other parts of electrical equipment;

3.5.2 To determine the nominal voltage of exposed live electrical parts;

3.5.3 To apply the safe approach distances specified in Table I-1(A); and

3.5.4 To establish electrically safe working conditions as established by Section 5.0 entitled "Establishing an Energy Isolated Safe Work Condition".

Table I-1(A)

Nominal System Voltage Range, Phase to Phase, AC	LIMITED APPROACH BOUNDARY		RESTRICTED APPROACH BOUNDARY	PROHIBITED APPROACH BOUNDARY
	Exposed Movable Conductor	Exposed Fixed Circuit Part		
< 50 V	Not Specified	Not Specified	Not Specified	Not Specified
50 V - 300 V	10 feet 0 inches (3.0 m)	3 feet 6 inches (1.0 m)	Avoid Contact	Avoid Contact
301 V - 750 V	10 feet 0 inches (3.0 m)	3 feet 6 inches (1.0 m)	1 foot 0 inch (0.3 m)	0 feet 1 inch (25 mm)
751 V - 15 kv	10 feet 0 inches (3.0 m)	5 feet 0 inches (1.5 m)	2 feet 2 inches (0.7 m)	0 feet 7 inches (0.2 m)
For nominal system voltage exceeding 15 kv, NFPA 70E approach boundary tables should be consulted prior to work.				

Personnel considered "competent" and/or "qualified" may be personnel or independent contractors. However, each facility manager or their designee will maintain a list of personnel considered "competent" and/or "qualified".

4.0 Testing Instruments and Equipment

4.1 **Rating**. Test instruments, equipment, and their accessories shall be rated for circuits and equipment to which they will be connected.

4.2 **Visual Inspection and Testing /Certification (0-600 volts)**. Test instruments and equipment and all personnel test 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 personnel to injury, the defective or damaged item shall be removed from service, and no personnel shall use it until repairs and tests necessary to render the equipment safe have been made.

Digital multi meters shall be sent out for certification and safety integrity check after an event such as but not limited to tripped internal overload protection, meter sustains a sharp impact, visible damage or does not pass pre-work inspection but in no case shall intervals exceed 5 years.

4.3 **Metering for 0-600 Volts**. Test instruments and equipment used on power circuits, including but not limited to, three phase motors, motor controls or soft starts, variable speed drives, 277 volt lighting, and power distribution panels should have a minimum rating of IEC 61010 Cat III – 600V, Cat IV – 600 V and be UL (Underwriters Laboratories) or CSA (Canadian Standards Association) or equivalent approved.

4.4 **Metering for > 600 Volts and Testing /Certification**. A non-contact voltage probe rated and certified for the voltages being tested, must be available for electrical personnel performing maintenance on equipment operating at or above 600 Volts and be UL or CSA or equivalent approved.

Non-Contact voltage probes and contact voltage meters shall be sent out for certification and safety integrity check after an event such as but not limited to tripped internal overload protection, meter sustains a sharp impact, visible damage or does not pass pre-work inspection but in no case shall intervals exceed 3 years.

5.0 Establishing an Energy Isolated Safe Work Condition

5.1 General. All sources of energy must be isolated and dissipated. All electrical circuit conductors and circuit parts shall be considered energized until all sources of energy are removed, at which time they shall be considered de-energized. Electrical circuit conductors and circuit parts shall not be considered to be in an electrically safe condition until all sources of energy (to include control voltage) are removed, the disconnecting means is under lockout/tagout/tryout, the absence of voltage is verified by an approved voltage testing device and an attempted start of the equipment, and, where exposure to energized facilities exists, are temporarily grounded. Lockout/tagout/tryout requirements shall apply to fixed, permanently installed equipment, to temporarily installed equipment, and to portable equipment.

An energy isolated safe work condition shall be achieved by the adhering to the following six (6) step process:

#1 Notify all affected personnel of intent to service equipment and the reason therefore.

#2 Determine all possible sources of energy to the specific equipment to include control sources.

#3 Shut down using the energy-isolating device so that the equipment is isolated from its energy source. Stored energy must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, valving, etc. For electrical equipment, after properly interrupting the load current, open the disconnecting device(s) for each source.

#4 Apply lockout/tagout/tryout devices in accordance with a documented and established site-specific policy.

#5 Confirm the equipment to be worked on is de-energized and all energy sources are isolated. This may be accomplished via an adequately rated voltage detector **and** by attempting to start the equipment to be worked on. Control switches, if present, **must**be set to manual prior to attempting to start the equipment, to prove it is isolated. After confirmation equipment will not start in manual from hand-off auto (HOA), turn switch to the off position and lock/tag at MCC.

CAUTION: Return operating control to "neutral" or "off" position after the test.

#6 Where the possibility of induced voltages or stored electrical energy exists, ground the phase conductors or circuit parts before touching them. Where it could be reasonably anticipated that the conductors or circuit parts being de-energized could contact other exposed energized conductors or circuit parts, apply ground connecting devices rated for the available fault duty.

5.2 Site Specific Lockout/Tagout/Tryout Procedures: Each plant shall develop and implement lockout/tagout/tryout procedures incorporating, at a minimum, the six step process contained within the electrically safe work condition six step process contained within Section 5.

5.3 **Lockout/Tagout/Tryout Devices**. Locks and tags used for control of exposure to energy hazards shall meet the following:

5.3.1 A lockout device shall include a lock with one functional key. Duplication of lockout keys is prohibited;

5.3.2 Lockout devices shall be attached and the locking mechanism secured so that removal of the lockout device may only be accomplished by key;

5.3.3 The lockout device key shall remain in the possession of the individual installing the lock.

5.3.4 The tagout device shall be adequately affixed to the lockout device or disconnecting means;

5.3.5 The tagout device shall contain a suitable warning and be signed by the individual who is doing the work;

5.3.6 If more than one individual is doing the work, each individual doing the work shall affix their own lockout device.

5.3.7 In the event of a shift change prior to completion of work requiring establishment of an energy isolated safe work condition, all workers going off-shift shall remove their lock(s) and tag(s). All workers coming on-shift shall adhere to the requirements of Section 5.0.

5.4 **Lockout/Tagout Devices Installation**. Each worker who could be exposed directly or indirectly to a source of energy shall install a lockout/tagout device onto the equipment isolation point prior to beginning work on the affected equipment.

5.5 **Group Lockout Devices**. A single lock may be used to lockout the machine or equipment with the key being placed in a lockout box or cabinet, which allows the use of multiple locks to secure it. Each worker will then use their own lock to secure the box or cabinet. As each worker no longer needs to maintain their lockout protection, that worker will remove their lock from the box or cabinet.

5.6 **Lockout/Tagout Devices Removal**. Lockout/tagout devices shall be removed only by the individual(s) who installed the lock, unless site-specific policies and procedures have been developed that identify a safe means of removal by the facility manager or their supervisor designee.

5.7 **Electrical Circuit Interlocks**. Workers installing lockout/tagout devices shall evaluate interlocked circuits prior to device installation in order to ensure that no electrical circuit interlock operation can result in reenergizing the circuit being worked on.

5.8 **Control Devices**. Lockout/tagout devices shall be installed only on isolation point devices. Control devices, such as pushbuttons or selector switches, shall not be used as the primary isolating device.

5.9 **Stored Energy**. The site -specific lockout/tagout procedure required by Section 5 shall address the hazards of stored energy by ensuring that:

5.9.1 All capacitors are discharged;

5.9.2 High capacitance elements are short-circuited and grounded before the equipment is touched or worked on;

5.9.3 Springs are released or physical restraint applied, when necessary, to immobilize mechanical equipment and pneumatic and hydraulic pressure reservoirs; and

5.9.4 Other sources of stored energy (e.g. head tanks, natural gas lines, etc.) are blocked or otherwise relieved.

5.10 **Equipment Release for Return to Service**. The site -specific procedure shall identify steps to be taken when the job or task requiring lockout/tagout is completed. The procedure should require that:

5.10.1 Before equipment is placed back into operation, appropriate tests and visual inspections are conducted to verify that all tools, mechanical restraints and electrical jumpers, shorts, and grounds have been removed, so that the circuits and equipment are in a condition to be safely energized;

5.10.2 Where appropriate, the personnel responsible for operating the machines or process shall be notified when equipment is ready for operation, and such personnel shall provide assistance as necessary to safely engage the equipment;

5.10.3 The area is to be inspected to ensure that nonessential items have been removed. This step ensures that all personnel are clear of exposure to dangerous conditions resulting from reenergizing the service and that blocked mechanical equipment or grounded equipment is cleared and prepared for return to service.

5.11 **Commissioning locks**: (aka Engineering or supervisor locks) are not personal protective locks and should never be used for personal safety. Commissioning locks only protect equipment and process during equipment commissioning operations and may have more than one key under the control of one or more workers. The installation of a commissioning lock is no indication that a device has been de-energized or locked out for personal safety. Contact the process or project engineer listed on the commissioning lock tag for further information. ALWAYS follow proper lock, tag and try procedures for personal safety.

5.12 **Energy Control Device Removal, Other Than by Worker Placing the Isolation Device.** Only the facility manager may remove someone else's lock/isolation device and then only after the following steps have been taken and documented.

5.12.1 Verification by the facility manager that the authorized personnel who applied the device is not at the facility.

5.12.2 Make all reasonable efforts to contact the authorized personnel to inform them that their lockout/tagout device will be removed.

6.0 Working with Live Electrical Equipment

6.1 Live Work Process.

6.1.1 Only a qualified worker can perform live work on electrical equipment.

6.1.2 For live work the Exhibit I1-3 Electrical Permit must be utilized.

6.1.3 In situations where it is necessary to perform calibration, testing, inspection, maintenance or sampling on energized equipment, a documented risk assessment must be completed by a competent worker and approved by the facility manager. Prior to approval, the facility manager must be satisfied that:

6.1.3.1 There are no alternatives to performing the work live;

6.1.3.2 Supervision will occur during the period of testing;

6.1.3.3 A Last-Minute Risk Assessment is performed; and

6.1.3.4 Verification that the control measures identified in the risk assessment will be implemented prior to starting the activity.

Exemptions to Work Permit. Electrical work shall be permitted without an energized electrical work permit if a Qualified and/or Competent worker is provided with and uses appropriate safe work practices and PPE in accordance with this document under any of the following conditions:

1. Testing, troubleshooting, or voltage measuring
2. Thermography, ultrasound, or visual inspections if the restricted approach boundary is not crossed.
3. General housekeeping and miscellaneous non-electrical tasks if the restricted approach boundary is not crossed.

6.2 Working with Voltages Less Than 600. There is to be absolutely NO live work on voltage greater than 250 Volts unless the requirements contained within Section 6 are followed. While testing or calibrating equipment when voltage is present, the requirements of Section: *Live Work Process* apply, and workers must wear or use proper personal protective equipment (PPE) as specified in either Section: *Electrical Arc Flash Protection* depending on the nominal voltages present. In the rare circumstance that power cannot be de-energized, the decision to work on energized equipment (or unguarded energized parts) will require approval of the Facility manager (or their designee) and the Vice President/Safety & Health (or their designee). Such approval will require development of a detailed work plan which is to be strictly followed.

6.3 Working with Voltages Greater Than 600. There is to be absolutely NO live work on voltage greater than 600 by personnel. The only exception to this prohibition is power taps for new transformer installations by licensed contract personnel. (Note: The most desirable and safest power tap is one in which the transformer can be taken off-line. Consideration for this method should always be given prior to live tapping). In the rare circumstance that power cannot be de-energized, the decision to work on a live tap will require approval of the Facility manager (or their designee) and the Vice President/Safety & Health (or their designee). Such approval will require development of a detailed work plan which is to be strictly followed. No other live work is allowed for voltages above 600 volts.

7.0 Electrical Arc Flash Protection

An electrical arc flash is a short circuit through the air. When insulation or isolation between electrified conductors is breached or can no longer withstand the applied voltage, an arc flash occurs. As personnel work on or near[1] energized conductors or circuits, movement near or contact with the equipment, or a failure of the equipment, may cause a phase-to-ground and/or a phase-to-phase fault. The result is an arc flash that may result in temperatures as high as 5,000 °F.

The safest way to address situations with electrical equipment is to work only when equipment is de-energized via established energy isolation procedures. When energy isolation has occurred, no electrical energy is present, no arc flash hazard exists, and no arc flash precautions are necessary.

In addition to arc flash personal protective equipment specifications below, the use of arc-rated clothing (i.e. pants, shirts, coveralls, etc.) rated to at least 11 cal/cm^2 is required for those personnel regularly performing electrical work on or near energized conductors (e.g. troubleshooting electrical circuits, wiring MCC's, running cable, replacing starters, etc.).

[1] The phrase "on or near" implies that the worker is working directly on or in close proximity to exposed live electrical energy and should not be interpreted to apply to situations where a worker is performing non-electrical work beside, for example, an operating electrical motor with no exposed electrical energy.

7.1 **Electrical Tools**. While working on electrical equipment when voltage is present, electrical personnel and contractors will use only insulated tools compliant with ASTM F1505- 01 entitled "Standard Specification for Insulated and Insulating Hand Tools" rated at 1,000 Volts.

7.2 **Working on circuits between 50 - 150 volts**. Approved for Qualified and/or Competent worker. While electrical energy is present, work on or near equipment between 50 -150 volts will require the use of the following:

- 7.2.1 Safety glasses.
- 7.2.2 Insulated (1,000 Volt) tools.
- 7.2.3 Class E hard hat and liner.
- 7.2.4 Individual insert ear plugs.
- 7.2.5 Snug fitting, heat and flame resistant leather or leather palmed Kevlar gloves.
- 7.2.6 Arc-rated long sleeve shirt/pants or coveralls -- minimum 11 cal/cm^2 with 100% cotton-based layer (t-shirt, thermal undergarments, etc.).
- 7.2.7 Electrically rated leather work boots.

7.3 **Working on circuits between 150 - 250 volts**. Approved for Qualified and/or Competent workers. While electrical energy is present, work on or near equipment between 150 -250 volts will require the use of the following:

- 7.3.1 Arc-rated face shield.
- 7.3.2 Insulated (1,000 Volt) tools.
- 7.3.3 Rubber gloves with heavy duty leather outer gloves. Arc-rated leather work gloves when voltage testing or troubleshooting. (minimum Cut level 4 and Cut 5)
- 7.3.4 Class E hard hat and liner.
- 7.3.5 Individual insert ear plugs.
- 7.3.6 Arc-rated long sleeve shirt/pants or coveralls (minimum 11 cal/cm^2) with 100% cotton base layer (t-shirt, thermal under garments, etc.)
- 7.3.7 Safety glasses.
- 7.3.8 Electrically rated leather work boots.

7.4 **Working on circuits between 250 – 600 volts and 800 amps or less**. Approved for Qualified and/or Competent workers. While electrical energy is present, work on or near equipment between 250 – 600 volts and 800 amps or less will require the use of:

7.4.1 Arc-rated face shield and balaclava.

7.4.2 Rubber insulating gloves with heavy duty leather outer gloves for work requiring a permit as described in Section 7.2. Arc-rated leather work gloves when voltage testing or troubleshooting as described in Section 7.2 (minimum Cut level 4 and Cut 5).

7.4.3 Insulated (1,000 Volt) tools.

7.4.4 Class E hard hat and liner.

7.4.5 Individual insert ear plugs.

7.4.6 Arc-rated long sleeve shirt/pants or coveralls. (minimum 22 cal/cm^2) with 100% cotton base layer (t-shirt, thermal under garments, etc.).

7.4.7 Electrically rated leather work boots.

7.5 **Working on circuits between 250 – 600 volts and > 800 amps**. Approved for Qualified workers ONLY. While electrical energy is present, work on or near equipment between 250 – 600 volts will require the use of:

7.5.1 Arc-rated face shield and balaclava.

7.5.2 Rubber insulating gloves with heavy duty leather outer gloves, for work requiring a permit. Arc-rated leather work gloves when voltage testing or troubleshooting. (minimum Cut level 4 and Cut 5)

7.5.3 Arc-rated outer garments (e.g. flash suit jacket, pant, and hoot). Minimum 40 cal/cm^2

7.5.4 Insulated (1,000 Volt) tools.

7.5.5 Class E hard hat and liner.

7.5.6 Individual insert ear plugs.

7.5.7 Electrically rated leather work boots.

Note: All electrical rooms housing equipment rated 800 amps or greater should be equipped with insulated, personnel rescue hooks. We should also require a “watch person” with a communication device, (similar to confined space) be present when the task requires 40 cal/cm level PPM.

7.6 **Protective equipment ratings**. Protective equipment ratings. The Arc Flash protective equipment specified will have the following protective ratings:

7.6.1 At least 11 cal/cm^2 for voltages between 150 and 600 and 800 amps or less.

7.6.2 At least 40 cal/cm^2 for voltages greater than 600 and > 800 amps.

7.7 **Inspection of protective equipment and tools**. Protective equipment and protective tools shall be visually inspected for damage and defects before initial use and at intervals thereafter as service conditions require, but in no case shall the interval exceed 1 year. Insulating gloves shall be given an air test, along with the inspection before each day’s use.

7.8 **Insulating gloves**. Inspection, testing and certification of properly rated rubber insulating gloves must be maintained. Rubber insulating gloves must be tested and re-certified every six (6) months (color code differently for each six (6) month period). If certified gloves remain unused and stored in a sealed bag, their certification and use can be extended to 12 months.

7.9 **Live line tools (Hot sticks)**. Each live-line tool shall be wiped clean and visually inspected for defects before use. If any defect or contamination that could adversely affect the insulating qualities or mechanical integrity of the live-line tool is present after wiping, the tool shall be removed from service, tested and re-certified, but in no case shall the interval exceed 2 years.

8.0 Line Breaking for protection caused by the unexpected release of hazardous materials

8.1 No one shall open any pipeline, or piece of process equipment, that contains or has ever contained a hazardous or hot material without complying with this procedure.

8.2 Individual in charge of repair/project:

8.2.1 The individual in charge of the repair/project shall have knowledge of the process under repair.

8.2.2 Needs to clearly identify the equipment to be worked on.

8.2.3 Obtain all necessary Safety Data Sheets SDS's for the hazardous material(s) present.

8.2.4 Review completed permit with all parties involved.

8.2.5 Insure all workers have been issued and are wearing the appropriate PPE.

8.2.6 Check the jobsite before to make sure all safe guards are in place and after to removed upon completion.

8.2.7 Shall have the area barricaded.

8.2.8 Shall notify workers in the affected area of the work that is to be performed.

8.2.9 Shall locate the nearest safety shower/eyewash station to the work area.

8.2.10 Shall be present when the line or process equipment is opened.

8.2.11 Notify lead operator periodically on the status of equipment.

8.2.12 Notify appropriate personnel upon completion of work.

8.3 Operations

8.3.1 Prepare equipment for repair.

8.3.2 Inform all affected personnel of status of the equipment prior to being taken out of service.

8.3.3 Inform all incoming operators of the repair work in progress or completed.

8.3.4 Inspect equipment upon completion of work and before being placed back into service.

8.4 Maintenance/Contractors

8.4.1 Review and understand job instructions and permits.

8.4.2 Review any additional procedures which may apply to the work being performed.

8.4.3 Review and understand all applicable SDS's.

8.4.4 Shall wear the appropriate PPE for the job as dictated by the SDS.

8.4.5 Notify affected personnel after equipment is safe for operation.

8.4.6 Notify appropriate personnel if the job has not been completed at the end of a normal shift.

8.4.7 Shall lock out and tag out all necessary equipment as listed on the permit.

8.4.8 Familiarize themselves with the nearest safety shower/eyewash station.

8.5 Prior to Opening:

8.5.1 The area shall be barricaded to prevent other plant personnel from entering the affected area.

8.5.2 Liquid material in the line shall be pumped and/or drained to a Section that can be isolated from the section to be opened. Liquid material, non-toxic, that can not be isolated must be drained to a suitable container and properly disposed of. All appropriate vents shall be opened to prevent vapor lock. All toxic material will be handled in accordance with their SDS's. The portion of the line to be opened shall be isolated from those preceding and following it in the most effective and safe manner as agreed upon by Maintenance, Operations, and worker in charge of repair/project.

8.5.3 All electrical equipment involved shall be isolated in a way that they will be in-operational through both operator and computerized control. This equipment is to be locked out in accordance with the Energy Isolation Program. Air pumps, where applicable, will be physically disconnected from the air supply and tagged in-operational.

8.5.4 When dealing with flammable solvents follow the Hot Work Program.

8.5.5 Communication between maintenance and operations shall be such that each department knows that the equipment and/or the line is being opened and that no other process work or maintenance is being done on the equipment and/or line at the same time without mutual agreement that such work presents no danger to personnel working on the equipment/line.

8.5.6 Vessels containing hazardous material shall be cleaned in a suitable manner or deemed safe by qualified personnel before being opened and any work is performed.

8.5.7 The minimum personnel protective equipment as outline in the PPE guidelines and/or dictated by the SDS's shall always be worn. Additional PPE may be required by the worker responsible for the repair.

8.5.8 If the contents are unknown a safe means of accessing and sampling shall be followed.

8.6 Opening the Line/Equipment

8.6.1 Breaking into a line is, in essence, breaking into a closed system and requires extreme caution to avoid exposure to any material that might be contained in the system.

8.6.2 Always position yourself to avoid direction of potential spray.

8.6.3 Use shielding wherever possible, including the use of partial flange covers.

8.6.4 If it is absolutely necessary to weld or perform hot work on a pipe line that has not been flushed, washed, and opened, a nitrogen blanket must be used.

8.6.5 When line breaking welded pipe, the line shall be isolated, purged and nitrogen blanketed.

8.6.6 If is absolutely necessary to burn flange bolts off with a cutting torch and flammable liquid is involved, the line must be broken at the nearest flange without the use of a cutting torch. If the flanged line cannot be broken without the use of a cutting torch to remove the bolts, all flange bolts must be replaced one at a time before separating the flange joint. The flange can then be separated and opened to the atmosphere. The remaining portion of the line not being worked on must be blocked. A Hot Work Permit must be issued prior to any hot work.

8.6.7 Slowly loosen the bolts farthest away from the worker so that any remaining pressure may be safely relieved.

8.6.8 If material begins to drain as the bolts are loosened, allow the material to drain completely before continuing to remove the bolts. Insure there is an adequate container to drain material into.

8.6.9 If it is a threaded connection, loosen the fitting slowly and carefully. Position a container in a way to catch any material still present in the line.

8.7 Completion of Work

8.7.1 Lines:

8.7.1.1 A final check must be made to insure that all openings are properly closed.

8.7.1.2 The line must be pressurized, whenever possible, using an appropriate method and completely checked for leaks before any material is put back into the system.

8.7.1.3 If a steam, air, or water line is worked on, it can be checked by personnel familiar with the process using the material inside the line originally.

8.7.1.4 Wherever applicable, all flange bolts shall be checked for tightness and gaskets for compatibility.

8.7.1.5 All Energy Isolation, Confined Space and Hot Work procedures shall be completed.

8.7.2 Tanks/Vessels

8.7.2.1 If dealing with a vessel/tank, the tank/vessel must be free from any debris before material can be placed back in the tank/vessel.

8.7.2.2 All bolts shall be checked for tightness before tank/vessel is placed back into service.

8.7.2.3 Tank/vessel, as well as pipe lines, shall be monitored for signs of leakage during and after material is charged back into the tank/vessel.

9.0 Purchase, design and modification of plant and equipment

The best method for achieving effective isolation must be determined prior to purchasing, designing or modifying plant and equipment. Consideration will be given to local isolation means and the frequency of work that will require isolation.

Energy Isolation Electrical Permit

PART 1: TO BE COMPLETED BY THE REQUESTER

Name of Requester		**Date of Request**	
Description of circuit/equipment/job location:			
Description of work to be completed:			
Justification of Permit:			

PART 2: TO BE COMPLETED BY THE ELECTRICALLY QUALIFIED PERSONS DOING THE WORK

Detailed description of job procedures to be used:		
Detailed description of job procedures to be used:		
Description of the safe work practices to be used:		
Means employed to restrict the access of unqualified persons from exposure:		
Positive results of the shock risk assessment:	**Yes:** ☐ **No:** ☐	**Details**:
Limited approach boundary confirmed:	**Yes:** ☐ **No:** ☐	**Details**:
Restricted approach boundary confirmed:	**Yes:** ☐ **No:** ☐	**Details**:
Necessary shock, personal and electrical PPE provided:	**Yes:** ☐ **No:** ☐	**Details**:
Positive results of the Arc Flash risk assessment:	**Yes:** ☐ **No:** ☐	**Details**:
Necessary Arc Flash PPE provided:	**Yes:** ☐ **No:** ☐	**Details**:

Approval of electrically qualified person doing the work: **Name & Title**:	**Date**:	**Approved** ☐

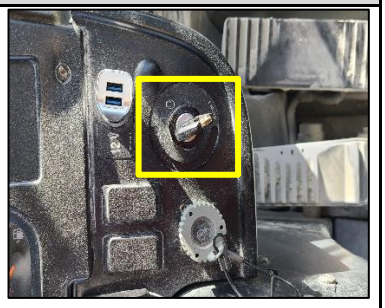
PART 3: APPROVAL(S) TO PERFORM THE WORK WHILE ELECTRICALLY ENERGIZED

Name & Title:	**Date**:	**Approved** ☐
Name & Title:	**Date:**	**Approved** ☐

	LOCK OUT TAG OUT TRY OUT PROCEDURE
Location: Pit	**EQUIPMENT: 966H LOADER**

EQUIPMENT OVERVIEW PHOTOS

PURPOSE	This procedure establishes the minimum requirements for the lockout of energy isolation devices whenever maintenance or servicing is done on this machine/equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energizing or start-up of the machine or equipment or release of stored energy could cause injury.
ISOLATION STEPS	1. Notify all Affected personnel before starting this LOTOTO procedure, including Plant Operator. 2. Shut down the machinery using normal procedures and operating controls. 3. Use energy control devices to isolate energy sources. Dissipate or restrain stored energy. 4. Apply lockout and tagout devices to energy control devices. 5. Check that no personnel are exposed, then operate the push button, other normal operating controls or test to verify the equipment cannot re-energize. 6. Return the controls to the neutral position after verifying zero energy.

SOURCE (MAGNITUDE)	ISOLATION POINT	APPLICATION METHOD / DEVICE	VISUAL REFERENCE
Electrical 1400CCA	Ignition key is located in the cab to the right of the steering wheel.	Turn ignition key to the off position. Remove key and maintain in a secured location. **EQUIPMENT NEEDED:** **LOTOTO STEERING WHEEL COVER**	

	LOCK OUT TAG OUT TRY OUT PROCEDURE
Location: Pit	**EQUIPMENT: 966H LOADER**

SOURCE (MAGNITUDE)	ISOLATION POINT	APPLICATION METHOD / DEVICE	VISUAL REFERENCE
Hydraulic XXXpsi	Vent cap on hydraulic fluid tank	With the key on use levers to move implements down. Vent hydraulic tank cap to relieve pressure in the hydraulic system.	
Hydraulic XXXpsi	Brake Accumulators	After venting hydraulic system, pump brakes 20 times to relieve pressure in the accumulator for the hydraulic brakes.	Need Photo
Electrical 1400CCA	Master switch located in compartment under cab platform at ladder.	Turn master switch to the off position. Remove key and apply cover plate locks and tags. **EQUIPMENT NEEDED:** **LOCKS & TAGS**	
Kinetic / Gravity	Articulation	Remove pin and swing arm to lock articulation. **EQUIPMENT NEEDED:** **PIN PULLER & DEAD BLOW HAMMER**	
Kinetic / Gravity	Bucket, Frame, Wheel hubs	Install cribbing or rated jacks under mill drum to replace bearings. **EQUIPMENT NEEDED:** **RATED JACKS OR CRIBBING**	

	LOCK OUT TAG OUT TRY OUT PROCEDURE
Location: Pit	**EQUIPMENT: 966H LOADER**

SOURCE (MAGNITUDE)	ISOLATION POINT	APPLICATION METHOD / DEVICE	VISUAL REFERENCE
Chemical	Radiator antifreeze petcock valve is located in the engine compartment adjacent to	Place bucket below drain line and open petcock valve to drain antifreeze from the coolant system **EQUIPMENT NEEDED:** **BUCKET OR CATCH PAN**	
Chemical	Diesel drain is located behind belly pan	Place bucket below drain and open valve to drain diesel from tank. **EQUIPMENT NEEDED:** **BUCKET OR CATCH PAN**	Need Photo

LOTOTO REMOVAL STEPS	1. Ensure all tools and other nonessential items have been removed and all equipment components are intact. 2. Confirm that all employees are in a safe location. 3. Ensure all guarding has been replaced. 4. Verify the controls are in neutral. 5. Remove lockout and tagout devices from energy control devices. 6. Reenergize the machine or equipment using the normal procedures and operating controls. 7. Notify Affected employees that servicing is complete and the machine or equipment is ready to use.

DOCUMENT CONTROL				
Approval:		Revision:	Effective Date:	

Procedure Name: **LOCKOUT/TAG-OUT PROCEDURE**	
Submitted by:	Department:
Date Issued:	Date Supersedes:
Procedure:	Page: 1 of 3
Approved By:_____	

PROCEDURE

The following guidelines shall be used for the control of hazardous energy on both OSHA and MSHA regulated sites.

PURPOSE:

To clarify the expectations of the Corporation regarding Lockout/Tagout procedures for OSHA and MSHA regulated sites.

GENERAL:

There are many instances that require control of hazardous energy at our facilities. The term hazardous energy is defined as the unexpected start-up of machines or equipment or the unexpected release of stored energy. The use of adequate and consistent lockout/tagout procedures when performing maintenance and repairs on both stationary and mobile equipment is essential to ensure the safety of our associates.

SPECIFIC:

Equipment shall be deenergized and isolated from the energy source before mechanical work is performed on such equipment. Energy isolating devices shall be locked out with suitable individualized locking devices or locking devices and tags. The individuals who are to perform the work shall sign the tags if applicable. This procedure does not supercede any other OSHA or MSHA requirements.

Steps for Lockout/Tagout

1. It is the responsibility of the manager or supervisor of each site to ensure that all energy sources for each piece of equipment are identified and labeled so that each energy source can be isolated.
2. Anyone who may be expected to perform service or otherwise have a need to isolate an energy source should be assigned a personalized lock. The personalized lock will be clearly marked with associates name and it will be the responsibility of each associate to keep track of their lock. Failure of an associate to keep track of their lock should be addressed similar to a violation of the PPE policy (100-711).
3. Everyone who would normally use the equipment being serviced must be informed of the Lockout/Tagout procedure and told not to attempt to start or energize the equipment.
4. Turn off all operating controls or move them to the neutral position. De-energize the equipment.

5. Place a personalized lock on the energy-isolating device. During routine repair and maintenance each individual performing work on that piece of equipment shall place his/her personalized lock on the energy-isolating device.
6. Release or block any stored energy or movable parts. This may include bleeding down a hydraulic line.
7. Check to see that no one is exposed, then attempt to operate the equipment using the normal operating controls if appropriate. Return the operating controls to neutral or "off" after this test.
8. The machinery or equipment is now ready for service or maintenance.

Steps to Return Equipment to Service

1. Check the machinery to be certain no tools have been left behind.
2. Check all safety guards to be certain they have been replaced properly.
3. Notify all affected associates that equipment is about to go back into production.
4. Remove the locks and tags (if applicable) from the energy isolating device(s) and restore energy to the equipment. In the event that an associate has left a lock on an energy isolating device but has left the site or is otherwise unavailable to remove the lock, the Plant/Site Manager or Foreman may remove the lock after ensuring that it is safe to do so.

Shift Changes

When multiple shifts work on the same equipment, it is the responsibility of the current shift's supervisor to ensure that the arriving shift has put individualized locks and/or tags on the energy sources before removing the earlier shift's locks and tags (if applicable).

Major Construction or Repair Projects

During major construction, repair projects, or where numerous pieces of equipment are involved, the Plant/Site Manager, Foreman, or an Authorized Person may lockout an entire segment of the plant where work is being performed, or several pieces of equipment with his/her lock and signed tag. In the event an entire segment of a plant or several pieces of equipment are locked out with one lock, each individual performing work on that equipment shall sign the tag prior to performing work on the equipment. An authorized person, who shall be responsible for ensuring the Steps to Return Equipment to Service procedure has been followed, is the only individual who may remove this lock.

Outside Personnel

When outside personnel, such as contractors, are on site and engaged in activities that require compliance with the Lockout/Tagout standard, it is the responsibility of the Supervisor in charge of the area or equipmentinvolved to ensure that the contractor complies with this Lockout/Tagout procedure or equivalent.

When inter-company personnel such as Support Services personnel, Central Services personnel, or Construction personnel are on site it, shall be the responsibility of the supervisor in charge of the work group to ensure that the Lockout/ Tagout procedure is followed. (If a construction crew were on site, it would be the responsibility of the construction foreman in charge to ensure that his/her people follow the procedure.) If no supervisor is with support personnel then it becomes the responsibility of the supervisor who is in charge ofthe equipment involved, to ensure the procedure is followed.

ACTION:

Each associate is responsible for following this policy. Managers are responsible for ensuring compliance with this policy. Failure to follow this policy will lead to performance management consequences up to and including termination.

APPENDIX D: EXAMPLE VEHICLE ISOLATION PLANS AND SEGREGATION ASSESSMENT TOOLS

1. **Vehicle Segregation Assessment Tool**
2. **Vehicle Pedestrian Segregation Policy**
3. **Fatality Prevention Assessment — Interaction of Equipment and/or People**

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Region:		**Site**		**Date**		**Time**	
Facilitator Name:		**Assistants**		**Assistants**			

Instructions for personnel completing this Vehicle Segregation Risk Assessment;

- It is recommended that a minimum of 3 persons conduct the assessment, one should be a Health & Safety Representative of the work group (if present at the worksite) or a person qualified or experienced in Health & Safety at the site to facilitate the assessment, and the others, members of the workgroup for the site, with at least one from overall site management.
- Complete the checklist below by ticking / marking the applicable score (Y, N, N/A) for each item.
- Assign a risk score for each activity using the matrix and decision charts for implementing further control measures below.
- Complete details of current controls in place or additional comments. Be sure to indicate if further control measures are required and detail the actions in the close-out section.
- Complete details including: Name, date and signature in the space provided.
- Return the completed form to the site manager, with cc to H&S representative, for corrective actions to be assigned, completed and closed out.

RISK MATRIX

Likelihood	**Consequences**				
	1 - Minor	**2 - Medium**	**3 - Serious**	**4 - Major**	**5 - Catastrophic**
A - Almost Certain	**Moderate**	**High**	**Critical**	**Critical**	**Critical**
B - Likely	**Moderate**	**High**	**High**	**Critical**	**Critical**
C - Possible	**Low**	**Moderate**	**High**	**High**	**Critical**
D - Unlikely	**Low**	**Moderate**	**Moderate**	**High**	**High**
E - Rare	**Low**	**Low**	**Moderate**	**Moderate**	**Moderate**

HIERARCHY OF CONTROL

The Hierarchy of Control **must** be used when determining how risks are going to be Eliminated or Minimized.

Start at **No. 1** and work down the order.

1. **Elimination** – remove the hazard from the workplace.
2. **Substitution** – use a different (safer) process, machine or chemical.
3. **Isolation -** as much as possible, isolate the hazard or hazardous work practice from people.
4. **Engineering** – install guards on machines, put in barriers around hazards.
5. **Administrative controls –** use policies, training and signs to warn workers.
6. **Personal protective equipment (PPE)** – use gloves, glasses, hearing protection etc.

PPE is always the **last option** used in the hierarchy of control as a means of protection!

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Risk Matrix Legends		
Rating	**Consequence - Health & Safety**	**Consequence - Asset**
1 - Minor	No treatment required or first aid	Slight Damage; no significant impact on operations; no loss in revenue
2 - Medium	Moderate injuries up to medical treatment	Minor Damage; damage to equipment; minor impact on operations; no loss in revenue
3 - Serious	Severe reversible injuries inclusive of lost time injury	Local Damage; severe damage to equipment; impact on part of operations; partial loss of revenue
4 - Major	Single fatality or permanent disability	Major Damage; major damage to equipment; delay in operations; short term loss in revenue
5 - Catastrophic	Multiple loss of life or permanent disabilities	Extensive Damage; long term impact on operations; long term loss in revenue

Rating	Likelihood
A - Rare	Will only occur in exceptional circumstances
B - Unlikely	Not likely to occur within the foreseeable future
C – Possible	May occur within the foreseeable future
D – Likely	Likely to occur once or frequently within the foreseeable future
E - Almost Certain	Almost certain to occur within the foreseeable future

Rating	Actions
Critical	Consider alternatives to doing the activity. Significant additional control measures must be implemented to ensure regulatory and/or internal protocol compliance. Consider additional controls that may feasibly bring the risk to as low as reasonably practicable (ALARP). Interim operations during process of identifying additional control measures must include elevated levels of risk communication and process management oversight to ensure control of the activity as a 'critical risk' operation.
High	Undertake the activity with existing controls in place if all regulatory requirements and internal protocols are met, at a minimum. Consider additional controls that may feasibly bring the risk to ALARP. If no other controls are feasible, elevate levels of communication and process management oversight to ensure control of the activity as a 'high risk' operation.
Moderate	Undertake the activity with existing controls in place. Consider additional controls that may feasibly bring the risk to ALARP.
Low	Undertake the activity with the existing controls in place. Controls are considered to be ALARP.

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Inspection item:	Y	N	N/A	Risk level	Existing Control Measures / Comments	Further Controls Required and Recorded?
1. VISIBILITY CONDITIONS						
Is there adequate visibility of thoroughfare in areas where pedestrians/traffic interact?						
Is there adequate visibility from lighting in vehicle operating areas before sunrise or after sunset?						
Is there adequate lighting for pedestrian movement before sunrise or after sunset?						
2. PARKING AREAS						
Are parking areas clearly defined and segregated for light vehicles and heavy vehicles?						
Are controls in place at parking areas to prevent light vehicles and heavy vehicles rolling away in the event of brake failure? e.g. berms, earthen mounds?						
Are car and heavy vehicles parking areas provided with separate entry and exit points to allow one-way traffic flow?						
Are all parking areas on level ground and surfaces free from slip and trip hazards?						
Are controls in place for overhead hazards?						
Are there designated parking areas that separate light vehicles and heavy vehicles around offices, crushing plants and maintenance areas?						
3. ACCESS AND EGRESS						
Are all entrance and exit points to the site clearly posted?						

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Inspection item:	Y	N	N/A	Risk level	Existing Control Measures / Comments	Further Controls Required and Recorded?
Do gates at the site entrance and exit areas have reflective signage for visibility at night?						
Are speed limit signs reflective to allow visibility during night-time operations?						
Are there signs and designated walkways in place for pedestrians in and around buildings?						
Are PPE requirements posted at entry of site and are all personnel wearing high-visibility clothing as per site requirements and/or where signs are posted?						
Are controls in place to keep pedestrians out of hazardous activity areas (e.g. parking areas, paths between shops, operations areas) and directives provided through signs or in VSP orientation?						
Are operational areas sign posted with “No Unauthorized Access” signage?						
Are visitors restricted from entering operational areas unless escorted by site personnel?						
Is there effective signage to identify overhead conveyors, powerlines, steep gradients, bridges and drains?						
Are all roadways clearly signposted with traffic control requirements? e.g. site speed limits, stop signs, one way, keep left; give way as per road rules under the road traffic act?						
Are heavy vehicle waiting, tarping and clean off areas signposted?						

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Inspection item:	Y	N	N/A	Risk level	Existing Control Measures / Comments	Further Controls Required and Recorded?
Is signage clearly visible on site when travelling in light vehicles? e.g. Not blocked by vegetation, stockpiles or materials?						
Are all entrance and exit points to the site clearly posted?						
Do gates at the site entrance and exit areas have reflective signage for visibility at night?						
4. SPEED LIMITS						
Are there designated speed limits for parking areas, offices, scales and workshop areas?						
Are there designated speed limits for primary and secondary roads? e.g. side and haul roads						
Are there designated speed limits around crushing equipment and other processing equipment?						
Are there designated speed limits for benches and levels, stockpiles and waste dumps?						
5. SURFACES						
Are all corners on levelled ground or provided with a positive camber (no negative cambers)?						
Are all roadways, benches and levels and waste dumps provided with drainage to prevent water pooling?						
Are walkways and surfaces where pedestrian access and egress free from slip / trip hazards?						
Are roadways where traffic operates free from road condition hazards?						

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Inspection item:	Y	N	N/A	Risk level	Existing Control Measures / Comments	Further Controls Required and Recorded?
Are roadways and parking areas free of stored materials, oil spills and rubbish?						
Is there a maintenance program in place for regular inspection, maintenance and repairs to pathways, roadways, signs etc.?						
6. EDGE PROTECTION AND RUNAWAY PROVISIONS						
Are safety berms in place on all edges of haul roads and embankments?						
Is access into areas where there are unprotected edges (no berms) on embankments being effectively controlled to prevent entry? e.g. blocked off						
Are safety banks a minimum of axel height of the largest vehicle and located minimum distance from the edges of embankments?						
Are safety banks made of suitable material to slow and stop a vehicle						
Are safety banks and windrows of a consistent form and free from erosion?						
Where safety berms are implemented on a slope to slow runaway heavy vehicles, are they of a consistent form and free from erosion?						
WHERE A RISK ASSESSMENT HAS IDENTIFIED VEHICLE RUNAWAY PROVISIONS ARE REQUIRED, ANSWER THE FOLLOWING QUESTIONS BELOW.						
Are escape ramps wide enough to accommodate the largest vehicle on site and free from erosion?						
Are the escape ramps easy to access in the event of a runaway emergency?						
Is the material used in the escape ramp providing high rolling resistance and sinking capabilities to stop vehicles?						

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Inspection item:	Y	N	N/A	Risk level	Existing Control Measures / Comments	Further Controls Required and Recorded?
Are escape ramp(s) of a suitable length to allow the vehicle time to stop in a runaway emergency?						
7. TRAFFIC MOVEMENT						
Is traffic entering and leaving the site in a safe manner?						
Have light vehicle and heavy vehicles right-of-way rules and other traffic controls been established and clearly communicated through signage?						
Are one-way roads signposted and clearly communicated to all users?						
Can light vehicle and heavy vehicle operators communicate clearly with each other? e.g. via VHF / UHF radio						
Are there provisions to manage high traffic volumes on site?						
Do one-way roads have control measures in place to allow safe passing (e.g. 1.5 times the width of the largest tired vehicle accessing the road, pull-out areas, communication procedures)?						
Are two-way roads 3 times the width of the largest tired vehicles passing side by side?						
8. LIGHT VEHICLES AND MOBILE PLANT						
Are light vehicles and/or heavy vehicles regularly inspected and serviced? e.g. pre-start inspections conducted, scheduled maintenance servicing plans						
Are light vehicles and or heavy vehicles clearly visible to pedestrians and other operators? e.g. vehicle mine flags, hi-visibility reflective strips, amber flashing light, lights on						

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Inspection item:	Y	N	N/A	Risk level	Existing Control Measures / Comments	Further Controls Required and Recorded?
Are the Ground Engaging Tools (boom or bucket) on all load-shifting equipment lowered when travelling or grounded when parked up?						
Is there sufficient room for light vehicles and heavy vehicles to load out from stockpiling / sales areas?						
Are operational areas clear of personnel where light vehicles, heavy vehicles and other equipment operate?						
Are heavy vehicles operating on slopes or uneven ground that may cause a loss of control or stability?						
Are there systems in place to ensure operators can be contacted immediately in the event of a site emergency?						
Do light vehicles and heavy vehicles maintain a minimum clearance between vehicles when travelling on roads as per operating procedures or traffic management plan? e.g. 100f – 150f distance exclusion zone						
9. HIGH RISK AREAS						
Is there a procedure in place to manage heavy wet weather conditions (e.g. pooled water or poor visibility, ice, dust, pooled water, fog, rain, heat, slippery conditions)?						
Are vegetation and materials managed to provide a clear view of intersections and signage at all times?						
Are blind corners around buildings fitted with convex mirrors to identify on-coming traffic or other personnel?						

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Inspection item:	Y	N	N/A	Risk level	Existing Control Measures / Comments	Further Controls Required and Recorded?
Have risk controls been implemented to manage blind spots where they cannot be eliminated?						
Are load-bearing structures and power poles protected with earthen mounds or barriers where there is a risk of contact?						
Is there signage to identify clearance distances between overhead structures and power lines?						
Is there signage stating “Stop” at railway line crossings? (If applicable)						
Is there signage on the side access tracks of railway lines stating “maintain 3m clearance from railway tracks at all times”?						
Have risk controls been developed for light vehicles and heavy vehicles to operate at night?						
10. DESIGNATED / RESTRICTED / UNAUTHORIZED AREAS						
Is there signage to identify designated waiting, tarping and clean off areas for heavy vehicles (road trucks)?						
Are there clearly defined loading / unloading areas? e.g. for deliveries, couriers, etc.						
Are designated loading / unloading areas provided with stable surfaces?						
Is there a designated refueling area allocated at the site?						
Are refueling areas and battery recharge stations protected by physical barriers?						
Are there clearly defined and demarcated safe areas?						

VEHICLE SEGREGATION RISK ASSESSMENT TOOL

Inspection item:	Y	N	N/A	Risk level	Existing Control Measures / Comments	Further Controls Required and Recorded?
Are safe areas protected by physical barriers?						
11. INSTRUCTION AND TRAINING						
Are all drivers / operators instructed and trained in the site traffic and pedestrian management requirements?						

12. SIGN OFF

Persons Conducting Assessment	Signature(s)	Date of Report

13. CORRECTIVE ACTION PLAN

Action No	Action required	Responsibility	Completion Date	Review Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

APPENDIX E: EXAMPLE LIFTING AND RIGGING PLANS AND CHECKLISTS

1. Crane Lift Plan
2. Hoisting and Rigging Plan; Inspection & Maintenance Checklist for Overhead Hoists
3. Lifting and Rigging Expectations
4. Crane Safety Policy

Crane Lift Plan

Instructions

1. The Crane Use Planning Process has two parts:
   - ✓ **Crane Lift Plan**
   - ✓ **Crane Daily Safety Review**
2. A Crane Lift Plan is required for every crane lift on a Dimeo project – see OSHA Subpart CC for definition of crane.
3. Critical crane lifts, if authorized, may have to be reviewed by a professional engineer (the contractor shall budget for the PE review) – see page 2, section 2 of the Crane Lift Plan for a list of critical lifts.
4. Crane Lift Plans must be submitted at least 48 hours (2 business days) prior to crane mobilization – 5 days for critical and helicopter lifts.
5. Crane Lift Plans must be based on worst case % of capacity (i.e. gross deductions / chart capacity) for each specific crane configuration and location and activity (for example: unload a delivery truck is a separate activity from erecting steel).
6. The Crane Lift Plan may be valid for more than one day, as long as the configuration, location, and parameters used for developing "worst case" condition have not changed. Use multiple lift plans for multiple locations.
7. All rigging devices *MUST* bear the name of the manufacturer and identify WLL and be certified as to their capacity. Custom-fabricated devices (lifting beams, spreader bars, etc) may be acceptable with proper PE stamp or proof testing as required by applicable standards. Capacities shall be marked and legible on all such devices.
8. Work that is not anticipated in the Crane Lift Plan, but may arise due to site conditions (moving equipment, loading materials onto floors, etc) must be reviewed with Dimeo in advance. Changes affecting crane configuration and / or location may require the Crane Lift Plan to be amended.
9. The subcontractor is responsible to visit the site prior to the lift date to review crane setup location and documentary information pertaining to the site, which is maintained by Dimeo. This information is also provided as part of the construction documents. The subcontractor is responsible (determining adequacy, supplying and installing) for all supporting material (as defined within 29 CFR 1926.1402) necessary for the crane lift.
10. The Subcontractor is responsible to obtain all information that is necessary to develop a power line safety plan.
11. The Subcontractor is responsible to train all personnel involved in the use of the crane, for example: Rigging, Signaling, Crane Operation and Assembly / Disassembly.
12. **The Subcontractor must provide the following information along with the Crane Lift Plan:**
    - ☐ Competent person designation forms for Rigger, Signal Person
    - ☐ Rigger and Signal Person training certification, OSHA 10 cards.
    - ☐ Jurisdictional Registration, for example: FAA permit,
    - ☐ JHA for truck load /unload, boom conflicts, public protection, Etc.
    - ☐ JHA for power line encroachment
    - ☐ Logistics plan
    - ☐ Weight of material – bill of lading, calculation, manufacturers product data sheet, etc.
    - ☐ Rigging plan
13. **The Crane Company must provide the following information as a supplement to the Crane Lift Plan:**
    - ☐ Competent / qualified person designation forms for operator and A/D supervisor
    - ☐ Worker credentials – license, medical certification, OSHA 10 cards
    - ☐ Load chart (complete with notes)
    - ☐ Range chart
    - ☐ Dimension illustration and specifications for crane
    - ☐ Lightning and wind restrictions (from operators manual)
    - ☐ Crane dimensions and area (quadrant) of operation diagram
    - ☐ Provide copy of annual 3rd party inspection certification and report – see Crane Lift Plan for requirements (Note: The inspector shall be certified with the CCAA – see www.CCAAweb.net local resources)
    - ☐ Scaled site plan and elevation drawings
    - ☐ JHA for Assembly/Disassembly of crane and severe weather
    - ☐ Jurisdictional Registration, for example: State of CT Fire Marshal Annual Registration
14. The crane activity shall comply with the Site Specific Safety & Loss Control Program (SSS&LCP).

No warranty or certification of the suitability of this plan is provided by Dimeo. It is the responsibility of the Subcontractor and Crane Contractor to ensure that they and their employees are qualified, competent, properly equipped and properly trained to perform the activities outlined in this plan. Further, to ensure that the equipment (i.e. crane and rigging) is inspected and utilized in accordance with this plan and in a manner that complies with OSHA and the manufacturer operator's manual, for example.

Crane Lift Plan

1. Lift Plan Responsible Persons

Project Name:	Date of Lift:	Lift Location:	
Subcontractor's Name:			
Contact Name:	Contact Number:		
Crane Company's Name:			
Contact Name:	Contact Number:	Operator ID:	A/D Supervisor ID:

2. Crane Information

Make:	Model:	S/N:	Capacity (tons):

Date Manufactured:	Does lift involve (if any box is checked, lift is critical)?	☐ ≥75% chart capacity ☐ Dual crane ☐ Personnel basket	☐ Two hooks ☐ Traveling with Load ☐ Other (refer scope)	☐ Over public space ☐ Tripping load

Carrier Information	Boom Information	Jib Information	
☐ Truck	☐ Telescoping ☐ Lattice	Jib deployed? ☐ No ☐ Yes – is it ☐ Fixed or ☐ Luffing	
☐ Rough Terrain	Block capacity (tons)	Block capacity (tons)	Offset: °
☐ All Terrain	# of Parts Line:	# of Parts Line:	Boom and Jib - Combined Length (ft):
☐ Crawler Block	Line Pull (lbs)	Line Pull (lbs):	
☐ Other	Working Boom Length (ft):	Jib length (ft):	

Power Line Encroachment Review		FAA Permit Review
Max working radius (ft): .	plus ½ length of load (ft):	Max working boom tip elevation (as assembled) in ft:
Will max working radius (plus ½ length of load) be within 20' of an overhead power line? ☐ No ☐ Yes		Will max vertical boom elevation exceed 200' above existing site elevation? ☐ No ☐ Yes
If yes, provide power line voltage:		If yes, provide FAA permit no.:
If yes, provide power line safety JHA - see OSHA subpart CC		

Outrigger Configuration / Distributed Load	
☐ Fully Extended ☐ Fully Retracted	Crane cribbing dimensions?
☐ Intermediate ☐ Rubber (PSI)?	Distributed Ground Bearing Pressure (PSF)?

Crane Condition				
Was crane idle >3 months since annual inspection?		Is crane a lattice boom?		Note regarding 3rd party inspection: If crane has been idle for longer than 3 months since last 3rd party annual inspection (inspection), or if crane being A/D is a lattice boom a new inspection certification and report must be provided post A/D). Exception: hydraulic crane with stowed jib that was included in the current annual 3rd party inspection. Inspector must be certified with CCAA (www.CCAAweb.net).
☐ No	☐ Yes	☐ No	☐ Yes	

3. Itemization of Crane Chart and Load Deductions

Weight of Heaviest Load (lbs):		Comment:
Rigging (lbs):		Comment:
Jib (lbs):		Comment:
Jib Hook (lbs):		Comment:
Hook Block (lbs):		Comment:
Load Line (lbs):		Comment:
Other (lbs):		Comment:
Gross Deductions (lbs):		Comment:

4. Lift Summary

Max Working Radius	Boom Angle	Gross Deductions	Chart Capacity	% of Capacity (Gross Deductions / Chart Capacity)

Crane Lift Plan

5. Load Characteristics	
Will this crane lift plan cover multiple picks?	☐ No ☐ Yes - explain:
Description of load(s) creating highest % of capacity (i.e. worst case load):	
Dimensions of load(s) creating highest % of capacity (height x width x length): ☐ Other dimensions, as follows:	
Weight of load creating highest % of capacity (lbs)? ☐ Calculation provided with rigging diagram ☐ Manufacturer product data sheet provided	
How will the Center of Gravity (COG) of the load be determined? ☐ Manufacturer data sheet – see attached ☐ Calculation – see attached ☐ In Field – explain below:	
Will any load be upended? ☐ No ☐ Yes (If yes, provide stability evaluation from manufacturer or PE)	

6. Rigging Information:		
List rigging components - be specific: manufacturer, number of pieces, description, size, length, capacity and component weight (NOTE: Job built equipment must be engineered and proof tested per OSHA 29 CFR 1926.251(a)(4)).		
Identify the minimum capacity component:	Capacity (lbs)?	
Rigging diagram		☐ see attached

7. Crane Location/Clearances	
a. Provide a to-scale plot plan showing crane location, adjacent buildings, pipe racks, and other significant obstructions within load swing radius. Indicate direction and span of swing	☐ see attached
b. Provide a to-scale elevation plan depicting crane, adjacent structures, and load	☐ see attached
c. What is the horizontal distance from the crane center pin to the nearest structure?	ft.
d. What is the minimum clearance from boom to highest point of structure during a pick?	ft.
e. What is the minimum clearance from load to highest point of structure during a pick?	ft.
f. What is the minimum distance from boom to load during a pick?	ft.
g. Has site been reviewed (actual and documentary information) as part of the development of this crane lift? ☐ Yes (and, no further information required) ☐ Yes (and, the following add'l information requested):	
h. Will the crane setup (or load) area be within zone of influence of foundation or underground facility? ☐ No ☐ Yes - explain what additional measures will be taken to establish proper support for crane:	
j. Describe signaling method: ☐ Hand ☐ Voice ☐ Voice with hands free radio for operator ☐ Other – explain:	

- ❖ Non-compliance with any part of this Crane Lift Plan will be grounds for immediate cessation of work and possible permanent removal from the site.
- ❖

Signatures	
Crane Company Responsible Person Signature:	Subcontractor Responsible Person Signature:

Daily Crane Safety Review

A suitable Daily Inspection Form may be substituted by the Crane Operator.

Date of Safety Review:	

Crane Information					
Make		Model		S/N	

The Following Items are in the Crane Cab:				
☐ Operators Manual including load chart and notes	☐ FAA permit and / or CT registration, if applicable	☐ Weather report	☐ 3rd party annual inspection report	☐ Completed daily inspection sheet, last three monthly inspection reports
☐ Copy of Crane Lift Plan	☐ Fire Extinguisher	☐ Equipment modification inspection completed, if applicable – see 29 CCR 1926.1412 (a) for requirements	☐ Post assembly inspection completed – see 29 CFR 1926.1412 (c) for requirements	☐ Copies of last three monthly inspection reports – see 29 CFR 1926.1412 (e) for requirements

Check the Following to ensure adequacy of condition and function:				
☐ Control mechanisms	☐ Control and drive mechanisms	☐ Air, hydraulic, and other pressurized lines.	☐ Hydraulic system – fluid levels	☐ Hooks and latches
☐ No broken or fogged glass	☐ Tires – condition and inflation	☐ Wedge Socket/Becket Properly Installed	☐ Ground conditions – under outriggers / supporting foundation, ground water accumulation	
☐ Wire rope reeving	☐ Wire rope – see 29 CFR 1926.1413 for requirements	☐ Electrical system	☐ Degree of level position is within tolerances specified by chart notes – pre and post shift and following each move	
☐ Hydraulic outrigger and stabilizer jacks – integral holding system	☐ Boom Angle Indicator	☐ Boom stops (lattice boom crane)	☐ Jib stops – if jib is deployed	☐ Horn
☐ Foot pedal locks, if applicable	☐ Crane level indicator	☐ Hand signal chart posted	☐ FAA markings, if required	☐ Warning decals
☐ Swing radius barricade	☐ Boom hoist limiting device	☐ LMI	☐ Potential conflicts with other booms have been mitigated through JHA	
☐ Backup / travel alarm working	☐ Anti-two Block Operational	☐ Brake test – load >90% of line pull	☐	☐

Confirm the following additional items:				
☐ Crane Configuration is per Crane Lift Plan	☐ Crane operating parameters (radius, load, location, etc.) is per Crane Lift Plan	☐ Voice communication – hands free required for radio	☐ Visual communication – line of site	☐ Taglines in Use
☐ Overhead load hazard exposure to other workers (except essential to load handling) has been mitigated through JHA				

Notes:

Name of person conducting safety review:	Signature:

Policy

All employees using lifting devices including mobile cranes or overhead cranes/hoists (e.g. manual, electric or air powered) will be properly trained in their safe use, inspection and maintenance to prevent injury to operating personnel and adjacent employees, and to prevent property damage from improper use. All cranes/hoists will be operated, inspected and maintained according to the requirements of this policy. Checklists and record-keeping requirements should be incorporated into each plant's site-specific policies and procedures.

Exhibits

Exhibit W1-1: Inspection & Maintenance Guide for Overhead Hoists
Exhibit W1-2: Inspection & Maintenance Checklist for Overhead Hoists
Exhibit W1-3: Chain Tension Relative to Configuration
Exhibit W1-4: Monorail/Hoisting System Testing
Exhibit W1-5: Mobile Crane Inspection Checklist
Exhibit W1-6: Sling Inspection Checklist
Exhibit W1-7: Sling Inspection and Use Guide

References

United States: 29 CFR 1910.179 – Overhead and Gantry Cranes
29 CFR 1910.108 Crawler Locomotive and Truck Cranes
30 CFR 56/57.16000 and .19000 sections
ANSI standard B30.16, Safety Standard for Overhead Hoists
ANSI standard B30.23, Personnel Lifting Systems
Canada: Ontario – R.R.O. 1990, Reg. 854: Mines and Mining Plants
Ontario – R.R.O. 1990, Reg. 851: Industrial Grupos de poder
Quebec – S-2.1 - Act respecting occupational health and safety
Mexico: The Mexican Federal Labor Law

Components

1.0 Definitions

1.1 **Boom [crane]** – A member hinged to the front of the rotating superstructure with the outer end supported by ropes leading to a gantry or A-frame and used for supporting the hoisting tackle.

1.2 **Boom Angle** – The angle between the longitudinal centerline of the boom and the horizontal. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline and boom point sheave pin centerline.

1.3 **Brake** – A device used for retarding or stopping motion by friction or power means.

1.4 **Bridge** – That part of a crane consisting of girders, trucks, end ties, footwalls and a drive mechanism which carries the trolley of trolleys.

1.5 **Bumper [buffer]** – An energy absorbing device for reducing impact when a moving crane or strolled reaches the end of its permitted travel; or when two moving cranes or trolleys come in contact.

1.6 **Cab-Operated Crane** – A crane controlled by an operator in a cab located on the bridge or trolley.

1.7 **Clearance** – The distance from any part of the crane to a point of the nearest obstruction.

1.8 **Counterweight** – A weight used to supplement the weight of the machine in providing stability for lifting working loads.

1.9 **Crane/hoist** – A machine for lifting and lowering a load and moving it vertically and/or horizontally, with the hoisting mechanism an integral part of the machine. Cranes and hoists include, but are not limited to overhead bridge cranes, single beam hoists, pendant and pedestal cranes and jib cranes.

1.10 **Critical Lift** – A lifting operation such as a non-routine lift, dual-pick lift or lift in a hazard area which, in the event of an accident, could cause unacceptable risk of personal injury; damage to equipment, materials, or other property damage; or significant delay of work.

1.11 **Drum** – The cylindrical member around which the ropes are wound for raising and lowering the load.

1.12 **Job** – An extension attached to the boom point to provide added boom length for lifting specified loads. The job may be in line with the boom or offset to various angles.

1.13 **Load Ratings** – Crane ratings established by the manufacturer.

1.14 **Mobile Crane** – A mobile powered machine for lifting and lowering a load and moving it vertically and/or horizontally, with the hoisting mechanism an integral part of the machine. Mobile cranes include but are not limited to wheel mounted or track mounted cranes, boom trucks, and service vehicle-mounted cranes and hoists.

1.15 **Overhead Hoist** – A crane with an overhead fixed hoisting mechanism or moveable bridge travelling on an overhead fixed runway structure.

1.16 **Outriggers** – Extendable of fixed arms, attached to the mounting base, which rest on supports at the outer ends.

1.17 **Periodic Inspections** – A visual inspection of a crane/hoist, performed by a competent person, typically a qualified third party.

1.18 **Pre-Use Inspection** – A visual inspection of a craned/hoist performed by an operator or maintenance worker prior to the use.

1.19 **Qualified Operator** – An individual having successfully completed documented training relative to the operation of the specific type of crane/hoist to be operated. A qualified operator must successfully demonstrate competency in skills and abilities required for safe operation of the

specific type of crane/hoist to be operated and where required by State or Local laws, fulfilled all certification requirements of that jurisdiction.

1.20 **Rope** – Wire rope, unless otherwise specified.

1.21 **Swing** – The rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

1.22 **Trolley** – The unit that travels on the bridge rails and carries the hoisting mechanism.

1.23 **Truck** – The unit consisting of a frame, wheels, bearings and axles which supports the bridge girders or trolleys.

2.0 Scope

2.1 This policy applies to all mobile cranes and overhead cranes/hoists (e.g. manual, electric and air powered lifting devices) to include cables, chains, hooks or sling lifting devices. The primary focus of this policy is tonnage rated lifting devices such as overhead hoists commonly found in maintenance shops or at strategic locations at plants where they are used for intermittent lifting of process equipment during repair or maintenance.

2.2 Devices such as come-alongs, screen deck pulley systems, supports for vibrators at conveyor tail pulleys, or other supports using cables and/or hooks are not the primary target of this policy, however, applicable portions of the policy that address wear and tear of components should be included in each site's preventive maintenance program.

2.3 Only properly trained individuals are permitted to operate hoists.

2.4 All crane/hoist operators will be familiar with each hoist owner's manual, especially concerning safety and maintenance procedures.

3.0 Responsibility

3.1 The Plant Manager or designee is responsible for site-specific compliance.

3.2 Supervisors are responsible to ensure all employees assigned to operate hoisting equipment have received the proper training and are physically and mentally capable of doing so.

3.3 All employees are responsible for performing documented pre-use inspections of hoisting equipment.

3.4 All employees are responsible to report any identified hazard that cannot be corrected or controlled to their supervisor immediately.

4.0 Overhead Hoist Inspections

Overhead Hoist Inspections. Inspection of overhead hoists and components are in two categories; pre-use and periodic. Hoists must be maintained in accordance with manufacturer instruction.

4.1 **Pre-Use Inspections**. Pre-use inspections must only be performed by qualified personnel. An overall inspection checklist similar to one developed by ANSI is provided as Exhibit W1-1. For each day that a hoist is used, and prior to hoist operation, a documented inspection shall be performed, including, but not limited to the following items:

4.1.1 Electric or air powered hoists:

4.1.1.1 The upper and lower limit switches, or auto stop switch will be functionally tested

4.1.1.2 The brake will be functionally tested

4.1.1.3 The chain/cable and hook will be visually inspected for defects/abnormalities such as fraying, nicks, twists, and deformities.

4.1.2 Manual hoists:

4.1.2.1 The chain/cable and hook will be visually inspected for defects/abnormalities such as fraying, nicks, twists, and deformities.

4.1.2.2 The hook(s) will be visually inspected for twists, increased throat distance, cracks, presence of safety clasps (on items where clasps were part of the original hook) and other defects

4.1.2.3 The mechanical system/housing will be visually inspected for functionality.

4.1.3 All defects during inspection shall be documented on a daily inspection form. Any defect(s) which may affect safe operation of the hoist shall result in the hoist being immediately taken out of service by means of tagging and locking-out. Such hoist shall not be utilized until the defect(s) have been corrected by a qualified person. Any hoist that has not been used for one year or more shall receive a "periodic" inspection prior to use.

4.2 **Periodic Inspections**. Periodic inspections may be performed monthly to annually depending on specific guidance contained within the lifting hoist service manual. Exhibit W1-2 contains a list of items generally included in a periodic inspection, but the specific list for each hoist must come from the lifting hoist service manual. Any defect(s) which may affect safe operation of the hoist shall result in the hoist being immediately taken out of service by means of tagging and locking-out. Such hoist shall not be utilized until the defect(s) have been corrected by a qualified person.

4.3 **Labeling of Trolly Beams**. All trolley beams to be utilized as part of an overhead trolley hoist system are required to be load rated with signage conspicuously posted indicating the maximum load that may be safely hoisted. Newly installed or unlabelled beams require external evaluation and certification by a registered professional engineer or internal evaluation by loading the system according to Exhibit W1-4 and inspecting for deformation or other signs of impending failure.

4.4 **Inspection Records**. Pre-use inspection records in which a defect(s) has been found shall be maintained until such defect(s) is corrected. Periodic inspection records shall be maintained for a period of 1 calendar year or until the next periodic inspection has been performed.

5.0 **Mobile Crane Inspections.** Inspection of mobile cranes and components are in two categories; pre-use and periodic.

5.1 Crane inspections will be conducted by an employee or third party who is deemed qualified or competent to inspect a specific type of crane.

5.2 **Pre-use inspections.** Pre-use inspections occur each day prior to the mobile crane being utilized. An inspection is not required on a day in which the mobile crane is not utilized. An overall inspection checklist has been provided as Exhibit W1-5.

5.3 **Periodic Inspections.** Supervisors will determine and schedule additional inspections periodically during crane use, where service conditions warrant. A thorough periodic inspection shall be made on a regular basis, to be determined based on: frequency of crane use; severity of service conditions; nature of lifts being made; experience gained on the service life of cranes used in similar circumstances; and as a minimum the following schedule:

Class	Description	Schedule
A	Standby or infrequent service	Annually
B	Light service (2.5 lifts/hour)	Annually
C	Moderate Service (50% capacity, 5-10 lifts/hour)	Annually
D	Heavy Service (50% capacity, 11—20 lifts/hour)	Semi-annually
E	Severe Service (near capacity, 20+ lifts/hour)	Quarterly
F	Continuous Severe Service (near capacity, continuous service throughout the day)	Bi-monthly

5.4 **Inspection Records**. Pre-use inspection records in which a defect(s) has been found shall be maintained until such defect(s) is corrected. Periodic inspection records shall be maintained for a period of 1 calendar year or until the next periodic inspection has been performed.

6.0 **Lifting Device Safety Requirements**. The following safety requirements apply to all lifting devices.

6.1 Only trained and competent operators shall operate cranes, hoists or lifting devices.

6.2 Only trained and competent persons shall rig loads to be lifted using standard rigging practices (ASME B30.9).

6.3 The load limit for the lifting device must be posted and easily visible to operating personnel.

6.4 The load limit for the lifting device must not be exceeded.

6.5 The lifting device must be in good working order and function properly.

6.6 The lifting device, if portable, must be:

6.6.1 Anchored securely; and

6.6.2 Secured to an anchor point (e.g. beam) that is load rated to at least the same rate as the lifting device.

6.7 Electric hoists must be equipped with functioning upper limit switches to prevent over travel.

6.8 Estimating the Weight of Loads

6.8.1 Lifting will not be conducted until load weights have been determined. When estimating load weights operators will stay within 50% of the crane/hoists rated capacity when estimating loads, or within manufacturer recommendations.

6.8.2 The following methods may be used to estimate the weight of loads:

6.8.2.1 Check equipment nomenclature plates

6.8.2.2 Check shipping papers

6.8.2.3 Consult with the equipment manufacturer

6.8.2.4 Estimate weight using weights or similar loads

6.8.2.5 Use a dynamometer

6.8.2.6 Use industry standard tables or charts

6.9 All personnel must stay well clear of the load being lifted to prevent injury if the load should release unexpectedly.

6.10 Any accessible area within the swing radius of any fixed or mobile crane/hoist shall be barricaded to prevent access.

6.11 If the lifting device operator is unable to see the load as well as the lifting mechanism, a spotter/signaler must be present.

6.11.1 Spotters/signalers must be trained in proper hand and/or radio signals, be tested in their use, and review their use prior to applications where they are required.

6.11.2 Only one designated and trained spotter/signaler shall give hand signals to the hoist operator, except in the case of "emergency stop "which can be given by anyone.

6.11.3 Every signal must be acknowledged by the operator.

6.11.4 Operation must be stopped any time communication between the operator and spotter/signaler is lost.

6.12 The load being lifted must be adequately secured to the lifting device using acceptable rigging practices.

6.13 Taglines shall be attached to loads that may require steadying or guidance while suspended. Personnel shall not "hold onto" suspended loads for steadying or guiding the load.

6.14 No mobile cranes shall be operated closer than 10 feet (3 meters) of live overhead power lines.

6.15 Mobile cranes shall not be operated without the use of outriggers, or without the full amount of counterweight as specified by the manufacturer.

7.0 Sling, Cable and Chain Safety Requirements. The following safety requirements apply to the use of slings, cables and chains:

7.1 General Safe Operating Practices

7.1.1 Never exceed the working load limit of the sling, cable or chain. The working load for a given sling varies depending on the configuration of the sling on the item being lifted – see the example contained within Exhibit W1-3.

7.1.2 Do not shock load the sling, cable or chain.

7.1.3 Protect slings, cables and chains from sharp corners and objects.

7.1.4 Chains for lifting shall be of Grade 80 or higher. When purchasing a chain, a tag indicating the grade should be attached to it. This tag, or a record of it, should be maintained with plant equipment records.

7.1.5 All hooks originally equipped with safety catches will be so equipped.

7.1.6 Use only alloy chain and components.

7.1.7 Do not use twisted, knotted, or kinked slings, cables or chains.

7.1.8 Do not drop loads on slings, cables or chains or attempt to pull rigging from under a load resting on it.

7.1.9 Balance all loads appropriately.

7.1.10 Before being lifted completely from its resting position, loads will be checked for proper balance and slippage of rigging.

7.1.11 Rigging and slings shall be properly stored in designated areas to protect against damage (e.g. corrosion, chemical burns, weld burns, etc.) and free from creating a hazard.

7.1.12 Additional sling safety reference materials have been prepared in Exhibit W1-7.

7.2 **Rigging Identification**. Slings, cables and chains having identification numbers and/or load limit ratings will be checked for legibility. Items having illegible identification will be removed from service immediately for disposal or load testing and remarking.

7.3 **Inspections**. Inspection of rigging equipment are in two categories; pre-use and periodic.

7.3.1 **Pre-Use Inspections.** Pre-Use Inspections must be completed for all slings, cables, chains, and all fastenings by qualified operating or maintenance personnel prior to each use. A documented inspection record is not required.

7.3.2 **Periodic Inspections**.

7.3.2.1 Shall be made on a regular basis to be determined based on: frequency of use; severity of service conditions; nature of lifts being made; and experience gained on the service life of rigging equipment used in similar circumstances.

7.3.2.2 Shall in no event be at intervals greater than once every 12 months.

7.3.2.3 Shall be recorded using Exhibit W1-6.

8.0 Lifting Hoist Accessories

8.1 Lifting hoist accessories such as material baskets, cages, buckets, gas cylinder holders, and drum holders must be designed for such purpose and load rated indicting the maximum load that they may safely carry.

8.2 Homemade (i.e. plant or contractor constructed) accessories intended for lifting or hoisting of materials are permissible, but only after review and approval by a licensed engineer.

8.3 If personnel are to be hoisted by means of a mobile crane (i.e. certified man basket), procedures for personnel hoisting found in ANSI B30.23 shall be followed, including, but not limited to:

8.3.1 Only personnel hoisting baskets manufactured in accordance with ANSI standards shall be used. Rigging used for personnel hoisting shall be designated for personnel hoisting only.

8.3.2 The designated rigging shall not be used for other purpose.

8.3.3 The crane used to hoist the personnel shall:

8.3.3.1 Be equipped with an anti-two block device that stops the upward hoist immediately.

8.3.3.2 Not be capable of freefall.

8.3.3.3 Be de-rated to 50% of its rated capacity for the personnel hoist.

8.3.4 A test lift must be conducted prior to the lift and after each crane movement and setup.

8.3.5 A pre-lift safety briefing must be conducted with all affected personnel.

8.3.6 Personnel being hoisted shall exercise 100% tie off using full body harness and lanyard unless being hoisted or working over water.

8.3.7 If being hoisted or working over water, personnel shall wear life jackets according to Policy F1: Personal Protective Equipment.

8.3.8 Lifts involving hoisting of personnel must have prior approval from the Regional Manager.

9.0 Training

9.1 Only individuals trained, and who demonstrate proficiency in the inspection and use of hoisting and rigging practices, shall be permitted to operate hoists.

9.2 Training must be documented for:

9.2.1 Initial training

9.2.2 Task training for use of a newly acquired lifting hoist

9.2.3 Annual refresher training for those individuals regularly using hoists.

9.3 Training may be provided via internal or external resources, however, regardless of the training resource utilized, the following subjects shall be part of the training:

9.3.1 Operating characteristics of the lifting hoist to include capabilities and limitations

9.3.2 The meaning of warning labels affixed to the hoist

9.3.3 Familiarity with the owner's manual

9.3.4 Safe work practices such as

9.3.4.1 Visual contact with load and device

9.3.4.2 Keeping the operator and others out of harm's way of a load

9.3.4.3 Safe rigging and handling of loads

9.3.5 Items of inspection and appropriate follow-through for defects found

9.3.6 A demonstration to the trainer, using each hoist to be used by the trainee, as to proper hoist operation and record keeping.

9.4 Personnel training records will be maintained for the duration of employment for each induvial so trained.

10.0 Contractors

10.1 All contractors using cranes, hoists or other lifting devices on site must comply with Hoisting and Rigging Program and shall be approved for such work through Contractor Management Program.

10.2 All contractors working areas where cranes, hoists or other lifting devices may operate must be informed of potential hazards.

	Inspection & Maintenance Checklist for Overhead Hoists	Revision Level:
Initiated by:	Section: **W1-2**	Page **1 of 1**

Type of Hoist:	Capacity (tons):	Location:
Original Installation Date:	Manufacturer:	Serial No.:

ITEM	DATE										COMMENTS/DEFICIENCIES
Operating Controls[1]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Limit Switches[1,3]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Brake Mechanism[1,3]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Hooks[1]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Suspension Lug (if used)[1]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Chain/Cable[1]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Rigging and Accessories[1]											
Hook and Suspension Lug Connections	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Pins, Bearings, Bushings, Shafts, Couplings, Chain Guides	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Nuts, Bolts, Rivets	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Sheaves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Housings, Load Block	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wiring and Terminals[3]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Contact Block, Magnetic Hoist Control Switch, Other Electrical Apparatus[3]	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Supporting Structure and Trolley (if used)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Nameplates, Decals, Warning Labels	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	

NOTE: Refer to Owner's Manual for further details.

[1] Prior to Each Day's Use – can be performed by the operator if properly trained.

[2] Periodic – Indicates items requiring inspection monthly to yearly. Inspections to be performed by or under the direction of a properly designated person. The exact period of inspection will depend on frequency and type of usage. Determination of this period will be based on the user's experience. It is recommended that the user begin with monthly inspections and extend the periods to quarterly, semi-annually, or annually based on monthly experience.

[3] For air and electric powered hoists in addition to all other items.

THESE EXPECTATIONS APPLY EQUALLY TO ALL CRITICAL CONTROLS:

- We are all accountable for our own safety and the safety of others.
- We always follow the rules, standards, and procedures
- We always consider alternatives to eliminate the need for high-risk activities.
- Everyone is appropriately trained, competent, and fit to work.
- Tools and equipment are to be used for their designed purpose.
- Everyone has the obligation to stop at-risk conditions and behaviors.

Lifting and Rigging Expectations:

- ☐ ***Ask:*** Is there a safer way to complete the job without lifting and rigging?
- ☐ **Comply with all the requirements for permitting and approval.**
- ☐ Only qualified or certified crane operators, riggers and signalmen with the require are used.
- ☐ All lifting devices and cranes are inspected prior to use.
- ☐ A lift plan was conducted if: the lift exceeds 75% of the rated capacity at the configuration used, the lift requires the use of more than one crane, the lifting of personnel in a platform or basket, or any lift that presents special hazards or circumstances.
- ☐ The use of 'homemade" or "job made" rigging equipment and rigging hardware is prohibited unless designed and approved by a division-selected engineer.
- ☐ The weight of the load to be lifted was determined before selecting rigging equipment and rigging hardware.
- ☐ Blind lifts are avoided.
- ☐ Only approved binding and chocking equipment are used for loads and pipe racks.
- ☐ Signalmen are in view of the crane operator
- ☐ Non-conductive tag lines are used to guide loads.
- ☐ Proper clearance, to include crane's full extension radius, is maintained when working near overhead power lines.
- ☐ Flagging, warning cones, and a spotter are being used when working near overhead power lines.
- ☐ Pick-up, lay-down and crane operating areas are barricaded and secure.
- ☐ There is proper space, ground conditions and outrigger deployment for mobile crane operations.
- ☐ No one climbs on or walks under loads.

APPENDIX F: EXAMPLE DRILLING AND BLASTING PLANS AND CHECKLISTS

1. Pre-Blast Review Form; Site Specific Drilling & Blasting Procedure Form; Drill Log Template; Pre-Blast Site Safety Meeting Example Topics
2. Drilling and Blasting Expectations
3. Standard Blasting Policy

Pre-Blast Review Form

Blast Security:

- Weather_____
- Who_____
- Where_____
- When_____
- Communication Method(s)_____
- Signage_____

Free Face Conditions:

The Drill Log(s):

PPE:

Designed Vs. Actual Burden & Spacing:

Borehole Deviations (diameter, orientation, and/or depth):

Overhead and Underground Hazards (including any notifications required):

Other Considerations and Concerns:

Blasters Signature:

_____Date:_____

Designated Employee's Signature:

_____Date:_____

Site Specific Drilling & Blasting Procedure Form

_____ Quarry

1. Date Requested: _____ Date Approved:_____ Approved By:_____

   Description of site specific procedure:

   _____

   _____

   _____

   _____

   _____

2. Date Requested: _____ Date Approved:_____ Approved By:_____

   Description of site specific procedure:

   _____

   _____

   _____

   _____

   _____

3. Date Requested: _____ Date Approved:_____ Approved By:_____

   Description of site specific procedure:

   _____

   _____

   _____

   _____

Blast Diagram Template

DATE: _____ **LOCATION:** _____ **SHOT #** _____

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
32																									
33																									
34																									
35																									
36																									
37																									
38																									
39																									
40																									

Design Comments:

Depth: _____ **Design Pattern:** _____

Sub-drill: _____ **Hole Diameter:** _____

Approx. Tons: _____

BLASTER: _____ **Date:** _____

SUPERVISOR: _____ **Date:** _____

ATTACH TO BLASTING RECORD

Drill Log Template

LOCATION		**HOLE SIZE**	In.	**# of HOLES**	
TYPE PATTERN		**BURDEN**	Ft.	**SPACING**	Ft.
FACE HEIGHT	Ft.	**SUBDRILLING**	Ft.	**GRID LOCATION**	

Hole #	Actual Depth Drilled	Actual Hole Angle (degrees)	Actual Hole Azimuth	COMMENTS ON HOLES (cracks, cavities, loose material on top, water, seams, etc. .)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

SPECIAL CONSIDERATIONS:

DRILLER: _____ **DATE:**

SUPERVISOR: _____ **DATE:**

BLASTER: _____ **DATE:**

COPY: DRILLER
BLASTER

Bulk Explosive Weight Tickets

Date:	
Blasting Company:	
Truck #:	
Gross Weight:	
Tare Weight	
Net Weight of Explosives Used:	

Date:	
Blasting Company:	
Truck #:	
Gross Weight:	
Tare Weight	
Net Weight of Explosives Used:	

Date:	
Blasting Company:	
Truck #:	
Gross Weight:	
Tare Weight	
Net Weight of Explosives Used:	

Pre-Blast Site Safety Meeting | Example Topics

Items to be considered:

- Are all blasting personnel wearing hard hats, safety shoes, safety glasses and high visibility clothing?
- Will it be necessary to perform work within 6 feet of the highwall crest? If yes, is approved fall protection equipment available?
- Have any necessary fall protection methods, as well as physical barricades been discussed with the Designated Employee?
- If applicable, have physical barricades been placed at the highwall crest?
- Has the drill log been prepared by the Driller and reviewed by the Blaster prior to loading?
- Has the Blaster inspected all free faces prior to loading?
- What is the minimum amount of stemming required?
- Vibration concerns (how may feet away and how many pounds per delay can be shot?)
- Direction of blast to minimize potential flyrock issues.
- What equipment may need to be moved out of the potential flyrock zone?
- Has the Blaster made certain that his or her personnel understand their role/s?
- Do the personnel involved understand what explosive product is being used and how much will be loaded in each borehole?
- Make sure the access onto the Blast Site can be achieved safely with equipment.
- Prior to loading, ensure that the Blast Site is barricaded with blast warning signs to protect against unauthorized entry and any non-essential vehicle being driven into the Blast Site.
- Check to see if any boreholes will have to be driven over to facilitate proper shot loading? If so, how can this be minimized without losing a borehole?
- Determine where Blast Area Guards need to be positioned.
- Will additional Blast Area Security assistance be required for this blast?
- Does everyone on the team have access to communications with other team members?
- Can the entire Blast Area be safely seen from the blast initiation location?
- Is there adequate shelter for the person triggering the blast?

THESE EXPECTATIONS APPLY EQUALLY TO ALL CRITICAL CONTROLS:

- We are all accountable for our own safety and the safety of others.
- We always follow the rules, standards, and procedures
- We always consider alternatives to eliminate the need for high-risk activities.
- Everyone is appropriately trained, competent, and fit to work.
- Tools and equipment are to be used for their designed purpose.
- Everyone has the obligation to stop at-risk conditions and behaviors.

Drilling and Blasting Expectations:

- ☐ ***Ask:*** Are all requirements of the Surface and Underwater Drilling and Blasting Standards being followed. **Deviations from the Standard Blast Designs will require Area Manager notification and approval.**
- ☐ **Comply with all requirements of the Surface and Underwater Drilling and Blasting Standards.**
- ☐ Proper fall protection is worn and tie-off to the approved anchor points are established when tasks are being performed beyond the seven-foot line marking the edge of the high wall.
- ☐ Work area was inspected prior to, during, and after drilling, loading, and post blast to ensure ground conditions are safe.
- ☐ Plant specific pre/post blast procedures were followed for barring entry into the blast area for non-authorized employees and make sure all personnel are removed from the blast area and are in designated safe areas prior to blast initiation.
- ☐ Drilling and explosive loading operations are not breaching the safe approach boundary for any overhead electrical lines or areas where mobile equipment are operating.
- ☐ Weather patterns that could create an electrical hazard prior to loading the shot were or are being evaluated and establish safe communication methods to avoid radio frequency interference are established.
- ☐ Prior to post blast inspection of high wall and muck piles, dust and gases were waited to dissipate.
- ☐ Misfire procedures are being followed and only approved personnel are permitted in the Planned Blast Area until the misfire has been disposed.

STANDARD BLASTING POLICY

POLICY STATEMENT

When blasting, the Storage, Transportation, Use and Record Keeping of explosives will be handled in a safe and efficient manner consistent with all applicable laws and regulations, i.e., DMME - Safety and Health Regulations - 4 VAC 25-40 and Federal Metal and Nonmetal Mine Safety and Health Regulations - 30 CFR 56 Subpart E and ATF&E Federal Explosives Law and Regulations - 5400.7

GENERAL

The following rules regarding blasting procedures will be observed by all operations. This includes fall protection under "six (6) foot rule" (refer to Policy 100-504) and use of the "Blasting Checklist" by each blaster when designing and preparing a shot.

In instances where these rules conflict with or overlap with those of local, state, or federal regulations, the blasting practice will be to abide by the more stringent regulation.

STORAGE

1. Locks and security devices will be checked or monitored daily on all explosive magazines, containing explosives.

2. Explosive inventories are to be kept at a minimum level. Maximum total inventory is determined by the Plant specific ATF&E Magazine Worksheet.

3. The explosive supplier's *DRAY Ticket* (Bill of Laden) is *Official Acquisition Record*. The *Official Acquisition Record* must be retained for five (5) years from the date of transaction.

4. Each plant will use the standard corporate "Record of Explosive Inventory" form for keeping the current count of explosives stored in each magazine. This is considered by ATF&E to be the *Daily Summary of Magazine Transactions (DSMT)*. The DSMT must be retained for five (5) years from the date of transaction.

5. A physical count of inventory will be performed to reconcile the "Record of Explosive Inventory" each time an order for explosives is placed. Reconciliations will be noted on the "Record of Explosive Inventory" form.

SHOT DESIGN

1. Shots will be laid out by a designated representative, approved by the Plant Manager.

2. Face height will be established by using a laser profiler, Abney level, burden pole and tape, or other approved means. Holes are to be drilled to a calculated depth.

3. No shot within the top twenty (20) feet of the rock formation will be drilled facing an adjoining property line, which is less than seven hundred fifty (750) feet from the blast site.

4. All drill holes will be adequately protected after being drilled. Adequate protection can be the insertion of a blasting tube into the drilled hole or covering of each hole the same day as it is drilled.

5. All drill holes will be drilled at the proper angle. The driller shall use tools or technology to ensure the proper angle is being drilled. The Blaster-in-Charge shall also apply tools, technology and collaboration with the driller to ensure every face hole is drilled as designed.

6. For each borehole intended for blasting, the driller shall produce a drill log as drilling progresses. In areas where voids, cavities or weak zones are suspected in the rock formation, the driller must inform the Plant Manager and his designated representative if such conditions are encountered when drilling. The drill log shall be signed by the driller.

7a. All pre-split shot designs will be reviewed, approved or executed by a Corporate Blasting Technician.
b. Surface preparation of the area from the pre-split to the free face shall be reviewed and approved by a Corporate Blasting Technician.

LOADING THE SHOT

1. Only persons designated as ATF&E Employee Possessors or Responsible Persons may handle or transport explosives.

2. All holes must be checked for depth, water, and obstructions before loading commences.

3. It will be the responsibility of the Blaster-in-Charge to consult with and receive permission from the Plant Manager or his designated representative to begin loading the shot.

4a. When using non-electric detonators, the maximum pounds per delay will be 850, unless governed by local laws of the county.

b. When using electronic detonators, the pounds per delay and timing shall be designed to produce ground vibrations less than half the level allowed by law (4 VAC 25-40-880, see modified from Figure B-1, Bureau of Mines R18507 graph) at any inhabited building not owned or leased Local laws of the county may include additional restrictions.

5. Shot delay sequence must be approved by a certified blaster and the Plant Manager or his designated representative prior to loading.

6. When using ANFO, all holes will be dry or dewatered

7a. All powder columns shall be initiated with two primers

b. For non-electric downhole primers, two (2) non-electric surface detonators of the same delay must be used to initiate each powder column. Any deviation to this principle must be reviewed and approved by a Corporate Blasting Technician. [Initiation of digital detonators does not involve surface detonators.]

8. Only a mushroom-type detonation device shall be used to initiate a non-electric shot. Only the electronic blasting machine intended for use with specific electronic detonators shall be used.

9. No drill cuttings, dust, or material larger than passing a $^{7}/_{8}$" sieve will be used as stemming material. Holes must have sufficient stemming.

10. In holes where a deck is to be used, the following table will be the MINIMUM amount of stemming used in each deck for these diameter holes:

Hole diameter			Stemming
5 ½	inches	-	6 4 feet
6 $^{1}/_{2}$	inches	-	7 ~~5~~ feet
7 $^{5}/_{8}$	inches	-	8 ~~6~~ feet

11. Explosives used in each hole will be recorded on the shot loading log sheet.

12. After each stick of powder is placed in a wet hole, a depth measurement will be taken to insure continuity of detonation.

13. All blasting is planned to occur between 9:00 A.M. and 4:30 P.M. at all locations. Site specific circumstances may prescribe specific times within this range when a shot may or may not be detonated. The shot shall be fired "as soon as possible" after completion of the loading process as determined by the *Blaster-in-Charge.*

14. The Plant Manager or his designated representative must see that all associates and equipment are at a safe distance from the blast area.

15. All in-plant avenues of approach to the blasting area, and all necessary public highways will be blocked and guarded during the blast.

16. The shot firer must have a communications device providing clear communications with anyone guarding the blast area in the event that the blast must be aborted.

17. Sound a warning alarm and call neighbors as necessary prior to blast.

WARNING CYCLE

One prolonged blast of siren for 60 seconds.
Wait for 30 seconds.
One prolonged blast of siren for 60 seconds.
Shot is fired 30 seconds after last blast of siren.
The Blaster-in-Charge checks the shot results.
One prolonged blast for 30 seconds to signal "all clear".

18. **Never** will the lead-in line be connected to the initiating devise until the blast area has been cleared.

19. Large boulders will be drilled and shot only with great care. Drill holes must be placed exactly as prescribed by the Blaster-in-Charge. If this is not possible, the boulder may not be shot using explosives. The drill plan and "as drilled" holes must be reviewed by a second experienced blaster to ensure their correct placement. Powder Factors must be reviewed for each hole, as drilled.

AFTER THE BLAST

1. After the shot has been initiated and the blast area appears clear, the Blaster-in-Charge, and the Plant Manager or his designated representative must check the blast area to see that all holes have fired before any other associates return to the work area.

   Misfires

   A. If a misfire occurs, no person shall enter the blast area for at least 15 minutes. The blasting area shall be guarded or barricaded and posted with warning signs until the misfire has been cleared.

   B. If a misfire occurs, appropriate personnel must be notified immediately. They are Plant management, Regional Operations management and Corporate Blasting Leadership.

   C. A site-specific plan must be developed for the safe handling of a misfire. This plan shall be approved by Plant management, Regional Operations management and Corporate Blasting Leadership.

2. Sound the all-clear siren after all the holes in the shot have been fired.

3. A shot report and shot loading log sheet(s) shall be filled out completely the same day of the shot and kept for at least five (5) years and be available for inspection by regulatory agencies (federal, state, and local). The seismograph report shall also be kept with the shot report.

4. The shot loading log sheet(s) must include the shot diagram, including burden and spacing for each hole, timing of detonation for each detonator used and the explosives used in each hole. The log sheet(s) and drill log shall be kept on file with the shot report.

5. The Plant Manager, or his designated representative, shall respond to any calls about the blast.

6. The *"Blasting Event Report Form* will be used to document calls from neighbors and the community regarding our blasting. Event documentation must be kept on file at each plant for at least three (3) years, plus the current year

7. Each Plant will have "*A Plan to Control the Effects of Blasting*" and act on the commitments of the Plan.

8. Any shot that produces air-overpressures or particle velocities at specific frequencies greater than half the level allowed by law (Department of Mines Minerals and Energy 4 VAC 25-40-880, modified from figure B-1, Bureau of Mines R18507 graph) at any inhabited building not owned or leased by Luck Stone Corporation will be reviewed by Corporate Blaster. All phases of the shot, from the shot design, timing, loading and the drill log will be used to try to determine what may have caused the higher readings. A recommendation for change will be made and documented for the next shot in the same area or condition.

9a. All pre-split holes, shot independent of production blasting, shall be located by high accuracy GPS surveying.

b. Any berming required adjacent to a pre-split shot will be constructed of appropriately spaced big rocks, or material berming. The berm must be constructed in a manor to ensure the location of the pre-split line remains visible.

10. Once a production blast has been shot to the pre-split line, the pre-split line should typically be recognizable. If not, further examination and determination shall be made using all technology currently available.

ACTION

All persons associated with the transportation, planning and using of explosives on property shall comply with this policy. It is the responsibility of each Plant Manager to assure that this policy is enforced at his plant.

Notes: Any deviation from the above policy must be approved by Plant management, Regional Operations management and Corporate Blasting Leadership.

APPENDIX G: EXAMPLE CONTRACTOR PLANS AND QUESTIONNAIRES

1. **Contractor Safety Program and Contractor Pre-Qualification Questionnaire**
2. **Contractor Pre-Job Meeting and Pre-Qualification Questionnaire**
3. **Suggested Documents for Independent Contractor to Keep in "Onsite Binder"**

Policy

The purpose of the Contractor Safety Program is to assure safety & health regarding the use of independent contractors on company property, as well as to enable proactive training with respect to independent contractors. We will provide each contractor with warnings of hazards and information about our programs for abating occupational hazards at our facilities. We will ensure all work is conducted in compliance with applicable Federal, State and Provincial regulations, as well as with host facility requirements and policies.

This policy describes the process by which safety & health expectations are communicated to contractors, contractor safety & health risks are identified and managed, and contractor performance is monitored and evaluated. This policy also describes the roles and responsibilities of and the contractor personnel in this process.

Exhibits

Exhibit Q-1-1: Contractor Verification System (CVS)Exhibit
Q-1-2: Contractor Risk Ranking Matrix
Exhibit Q-1-3: Contractor Verification Flow Chart
Exhibit Q-1-4: Independent Contractor Information Log
Exhibit Q-1-5: Independent Contractor Register
Exhibit Q-1-6: Sign In/Out Log
Exhibit Q-1-7: Pre-job Meeting Agenda
Exhibit Q-1-8: Capital Project Safety Manual Table of Contents (TOC)
Exhibit Q-1-9: MSHA Contractor Management Guidance
Exhibit Q-1-10: Contractor Documentation Checklist
Exhibit Q-1-11: Tools or Equipment Lending Checklist
Exhibit Q-1-12: Sample Evaluation Form
Exhibit Q-1-13: Ontario Project Management Guidance
Exhibit Q-1-14: Quebec Project Management Guidance
Exhibit Q-1-15: Pre-bid/pre-work safety program checklist

References

United States: MSHA 30 CFR Part 45
Canada: Ontario/Quebec Project Management Guides (Exhibits Q-1-13, 14)
Mexico: The Mexican Federal Labor Law and NOM-031-STPS-2011, Construction-Health and safety conditions at work.

Components

1.0 Definitions

1.1 **Independent Contractor**: any person, partnership, corporation, subsidiary of a corporation, firm, association or other organization that contracts to perform services or construction at a mine. Contractors include any person hired by the prime contractor or sub-contractor.

1.2 **Contractor Manager:** The employee or its delegate is responsible for managing the engagement of the contractor and as such has an ongoing oversight role during the work.

1.3 **Contractor Supervisor**: The employee or its delegate is responsible for direct monitoring of the day-to-day work of the contractor and as such should be active in the induction process. Is also key to maintaining compliance with the requirements and ensuringeffective communication at all times.

1.4 **Contractor's Representative:** The contractor's designated primary point-of-contact for the work being performed on the site and as such is key to maintaining compliance with the requirements and ensuring effective communication always.

1.5 **Visitor:** any person entering a property other than employees, contractors orcustomers.

1.6 **Contractor Verification System (CVS)**: The method to manage major and/or embedded contractors working at sites. Information provided will include

1.6.1 Internal Management Systems;

1.6.2 Safety & Health Programs;

1.6.3 Individual Training & Qualifications; and

1.6.4 Injury & Illness Statistics.

2.0 Contractor Selection and Qualification

2.1 will use a Contractor Verification System (CVS) for qualifying and managing major and embedded contractors and subcontractors who are engaged in high potential loss work on sites (see Exhibit Q-1-1.)

2.2 The Contractor Risk Ranking Matrix (Exhibit Q-1-2) is provided as guidance to aid Contractor Managers in identifying what contractors are required to qualify via the CVS. Alongwith this matrix, Site Managers are encouraged to require any contractor to subscribe toCVS where, based on the contractor's anticipated work, he/she determines this matrix does notadequately reflect the risk associated with the work or where CVS participation is otherwise beneficial to.

2.3 When a new contractor has been identified and is determined by to be CVS required, thesite will initiate the CVS (see Exhibit Q-1-3.)

2.4 For contractors identified as Low Risk/Exempt Contractors, or are otherwise approved as exempt, every effort must be made by the Site Manager or designee to ensure the contractors selected have the appropriate structure, systems, training, and culture to meet minimum safety & health standards, policies, and procedures.

2.5 The flow chart in Exhibit Q-1-3 depicts the process of qualifying a contractor for work on sites.

2.6 As a part of the bid (or pre-work) process for contractors, Exhibit Q-1-15 may be distributed to contractors for identification of high-risk activities which will be verified after awarding of the bid. Completion of this checklist will allow the site an overview of the safety programs of the contractor prior to awarding of the bid.

3.0 Contractor Induction and Onboarding to Standards

3.1 Contractor Induction is the process by which connects the qualification/selection processto the anticipated work, ensuring that there is a common understanding of the scope, tools, and methods of the work. This process should also serve to verify that:

3.1.1 All expectations have been communicated;

3.1.2 All appropriate programs are in place;

3.1.3 Necessary/required training has been completed;

3.1.4 All necessary equipment will be available; and

3.1.5 Communication protocols are established.

3.2 To assist in this process, each site must develop a Site-Specific Contractor Induction Policy & Procedure that ensures effective induction of all contractors performing work on Sites. This Site-Specific Policy must contain several key elements:

3.2.1 Per 30 CFR 45.4, an independent contractor register shall be maintained by each site (e.g. Exhibits Q-1-4 and Q-1-5);

3.2.2 A formal Sign In/Sign Out Procedure and Log (e.g. Exhibit Q-1-6);

3.2.3 A Site-Specific Hazard Awareness Training Procedure that incorporates additional review of specific Policies & Procedures relevant to the work;

3.2.4 A standard Pre-Job Safety Meeting Agenda to guide a Contractor Manager and Contractor Supervisor in conducting a thorough Pre-Job Safety Meeting. Exhibit Q-1-7 is provided as an example of such an agenda; and

3.2.5 A standard Table of Contents for a Site Safety & Health Manual to be used to build a manual for use by large, long term, and/or embedded contractors so that the Contractor has ready access to the various forms, policies, and emergency information necessary to conduct business on sites. Exhibit Q-1-8 is an example used by Engineering formajor Capital Projects.

3.3 Formal assignment of individuals in key roles will occur as part of the Induction Process for a contractor to ensure there are clear lines of accountability and communication. The Site Manager is ultimately responsible for ensuring these roles are assigned and that the individuals assigned understand and are willing and capable of carrying out these responsibilities. The roles and responsibilities in the Induction Process are as follows:

3.3.1 Contractor Manager - the employee or its delegate is responsible for managing the engagement of the contractor which includes but is not limited to:

3.3.1.1 Determine if the Contractor must be included in the CVS;

3.3.1.2 Communicate the contractual, statutory, and other health and safety requirements to the contractor before the start of the contract, according to the plan and the JHA of the whole project.

3.3.1.3 Ensure Site Specific Hazard Training is complete;

3.3.1.4 Lead the Pre-Job Safety Meeting;

3.3.1.5 Ensure appropriate communication protocols are established so that all affected individuals (employees, other contractors, etc.) are aware of the work;

3.3.1.6 Determine an appropriate schedule for Post Job or Routine Work Evaluations and;

3.3.1.7 Engage and motivate contractors and their employees to work safely

3.3.2 Contractor Supervisor - the employee or its delegate is responsible for directmonitoring of the day-to-day work of the contractor and should therefore be an active part of the induction process. The Contractor Supervisor has responsibilities that includebut are not limited to:

3.3.2.1 Participate in the Pre-Job Safety Meeting to ensure that a detailed methodology has been developed, and that risk control procedures are employed (e.g. Job Hazard Analysis, SLAM, etc);

3.3.2.2 Ensure the work is appropriately scheduled and communication can be properly executed; and

3.3.2.3 Verify through review of training records that the contractor has the skills & competency to perform the work.

3.3.2.4 The Contractor acknowledging a strong commitment to safety & health and the Contractor affirms that it has a copy of the Safety Management Policy and associated procedures which are actively supported and endorsed by the Contractor's management. The Contractor represents that its written policy is widely disseminated and understood among its employees, and that its policy includes a description of the Contractor's organization, procedures and methods of communication to and from personnel.

3.3.3 Contractor Representative - The contractor's designated primary point-of-contact for the work being performed on the site which includes but is not limited to:

3.3.3.1 Ensure that the contractor's internal systems are in place such that all safety & health standards, policies, and procedures are met:

3.3.3.2 Ensure that all safety & health concerns and incidents are brought forward to Contractor Supervisor or Contractor Manager immediately; and

3.3.3.3 Participate in the Pre-Job Safety meeting.

4.0 Monitoring Performance of Contractors

4.1 Once the induction process is completed and the contractor is ready to begin work on the site, Contractor Manager, Contractor Supervisor, and the Contractor Representative have additional Roles & Responsibilities to ensure the work is performed safely and in accordance with the expectations set in the Induction process (see Exhibits Q-1- 9, 13, 14 Contractor Management Guidance.)

4.1.1 Contractor Manager – the employee or its delegate is responsible for managing the engagement of the contractor, and as such has an ongoing oversightrole during the work. These duties include but are not limited to:

4.1.1.1 Communicate regularly with the Contractor Supervisor to monitor progress and review concerns;

4.1.1.2 Report any critical failures to Corporate Safety & Health immediately;

4.1.1.3 Review Field Safety Contact forms;

4.1.1.4 Participate in subsequent safety briefings if requested or necessary;

4.1.1.5 Continue to engage and motivate Contractors and their employees to work safely; and

4.1.1.6 Ensure that the Contractor's Site Safety & Health Manual is kept up to date.

4.1.2 Contractor Supervisor – the employee or its delegate is responsible for directly monitoring the day-to-day work of the contractor. An example of these duties includes but are not limited to:

4.1.2.1 Monitor the Sign In/Sign Out Log to ensure it is being used consistently;

4.1.2.2 Work with the Contractor Representative, ensure that any new contractor employees are fully inducted before performing work on site;

4.1.2.3 Ensure that necessary regulatory paperwork, such as workplace exams, pre-use inspections, and work permits are being completed by conducting regularly scheduled and documented inspections. Such inspections should include site and contractor leadership;

4.1.2.4 Monitor the performance of the contractor by conducting periodic documented observations for safe behaviors such as last-minute risk assessments (SLAM), seatbelts, wheel chocks, and PPE;

4.1.2.5 Complete Field Safety Contact form for these periodic inspections and observations. Exhibit Q-1-10 is a sample form for verifying Contractor paperwork;

4.1.2.6 Leading or participating in any regularly schedule or subsequent safety briefings;

4.1.2.7 Reporting any critical failures to the Site Manager immediately;

4.1.2.8 Empower and lead Contractors in all aspects of Safety & Health; and

4.1.2.9 Ensure all Level 2, Medical Aid, Modified Duty, or MSHA Reportable contractor incidents are entered into incident reporting system.

4.1.2.10 If tools or equipment are lent to a contractor, ensure that the process outlined in Exhibit Q-1-11 is followed.

4.1.2.11 Participate in coordinating corrective actions for any items reported as unsafe conditions observed in the site that impacts work being completed by the contractor.

4.1.3 Contractor Representative – Is the Contractor's designated primary point of contact for the work being performed on the site and as such is key to maintaining compliance with the requirements and ensuring effective communication at all times. Those duties include but are not limited to:

4.1.3.1 Ensure that all contractor employees are utilizing the Sign In/Sign Out process (e.g. Exhibit Q-1-6);

4.1.3.2 Notify the Contractor Supervisor if any new contractor employees are expected on site, so that their Induction can be completed;

4.1.3.3 Monitor the Contractor's activities to ensure that all safety & health standards, policies, and procedures are met;

4.1.3.4 Monitor the Contractor's work to ensure that all risk controls are implemented, that last minute risk assessments (SLAM) and JHA's are completed, and that necessary equipment is available and being properly utilized;

4.1.3.5 Ensure Job Hazard Analyses (JHAs) are performed for:

4.1.3.5.1 Any identified high-risk activity;

4.1.3.5.2 Any new task;

4.1.3.5.3 Any change to an old task; and

4.1.3.5.4 For any new worker.

4.1.3.6 Ensure that all safety & health concerns and incidents are addressed immediately and in an appropriate manner;

4.1.3.7 Ensure that all safety & health concerns and incidents are brought forward to the Contractor Supervisor and/or Contractor Manager immediately; and

4.1.3.8 Participate in the Pre-Job Safety meeting and all subsequent safety briefings.

4.1.3.9 Report to Contractor Supervisor any unsafe condition or act generated byour process which may impact them during the development of the contractor's tasks.

5.0 Contractor Evaluation

5.1 Post-job evaluations must be performed by the Contractor Manager with input from the Contractor Supervisor to evaluate all high-risk contractors (as determined by using Exhibit Q-1-2) at the completion of any work performed as part of a Capital Project where the specific work has a defined scope and completion date.

5.2 Routine Work Evaluations must be performed on a schedule determined by the Site Manager in conjunction with the Contractor Manager and Contractor Supervisor. The schedule should be based on the Contractor's Risk Ranking, as well as other pertinent factors but should be completed at least once during a project or at a minimum annually.

5.3 While the schedule for evaluations is largely at the discretion of the Site Manager, the frequency must be sufficient to identify contractors who are performing well and separate them from the contractors where improvement is required. The Evaluation Schedule must be updated as contractors are added or as conditions change.

5.4 For major and embedded contractors who are included in the CVS, a contractor evaluation and review are required annually. Evaluation protocols can be created and customized in order to capture the appropriate performance information (see Exhibit Q-1-12 as an example.)

5.5 For Contractors not in the CVS, but where evaluations are necessary or beneficial, a form can be used or created such as Exhibit Q-1-12 as a generic Post-Job Evaluation. In both cases the evaluations are completed using the documented Field Contacts, as well as interviews with a cross section of employees who had regular interaction with the contractor.

6.0 Independent Contractor Requirements

6.1 Must comply with appropriate Federal, State and Provincial Regulations which include but are not limited to: OSHA CFR 29, MSHA CFR 30 & Federal Rail Road Administration (FRA).

6.2 Must comply with site-specific safety and health procedures, and all posted Safety rules and signage.

6.3 Must sign-in for each shift unless extended work has been developed with a supervisor contact for a documented pre-shift orientation meeting.

6.4 Must comply with all applicable provisions of federal, state and local regulations, laws and ordinances.

6.5 Must be informed of the provisions in the site-specific Emergency Action Plan.

6.6 Must have Safety Data Sheets for any chemical in use or stored on the property.

6.7 Medical Clearance: The contractor must ensure that employees have appropriate medical clearance when required either by regulation or by the host facility's requirements. Copies of

medical clearance for contractor personnel must be submitted to the Contractor Manager or designee as specified by the contract.

6.8 Respiratory Equipment: Where respirators are required, the contractor must prepare and implement a written respiratory protection program and make the document immediately available to the Contractor Manager or designee upon request.

6.9 Contractor-Supplied Hazardous Substances: Each contractor bringing hazardous substances on-site must provide the Contractor Manager or designee with the appropriate hazard information for these substances, including SDSs, labels, and precautionary measures to be taken when working with or around such substances.

6.10 Contractor Tools and Equipment: All equipment, mobile equipment and tools provided by the contractor to their employees must be fully compliant with regulatory requirements and in excellent working condition.

6.11 Inspections:

6.11.1 The contractor must ensure competent employees conduct pre-shift and pre-operational inspections of the worksite(s), materials, and equipment.

6.11.2 The contractor must maintain detailed written inspection records and make them available for review by the Contractor Manager or designee.

6.12 Incident Management: The contractor must report all accidents or incidents resulting in a fatality, injury, illness, and/or damage to or loss of property to the Contractor Manager or designee, in addition to fulfilling regulatory reporting requirements.

6.13 In accordance with and site-specific policies, the contractor is responsible for providingor obtaining appropriate medical and emergency assistance and for notifying emergency response personnel, law enforcement, safety and health regulators, and family members, when appropriate.

6.14 Accident Scene Procedures: Except for rescue and emergency measures, the contractor must not disturb the scene of the accident or incident and must cease all operations in or related to the immediate area of the accident until authorized to resume by the Contractor Supervisor or designee.

6.15 Personal Protective Equipment (PPE):

6.15.1 The contractor will provide PPE for all their employees.

6.15.2 The contractor will ensure that its employees have received appropriate training on the use and maintenance of PPE before its use.

6.15.3 See Corporate Policy F-1 for Minimum Personal Protective Equipment

6.16 Non-Compliance with Safety and Health Requirements:

6.16.1 If during the contract, the Contractor Supervisor or designee notes any situations of noncompliance with the contractor's safety and health performance or host facility's safety and health requirements, the Contractor Supervisor or designee will verbally communicate the problem to the contractor and will immediately follow up in writing.

6.16.2 Failure to correct the violation or continued violations will be grounds for termination of the contract.

6.17 The Contractor Supervisor or designee will document all violations brought to the attention of the contractor.

CONTRACTOR
PREQUALIFICATION QUESTIONNAIRE

Contractor Name:_____ Date: _____
Address:_____ City, ST, Zip _____
MSHA ID# :_____ Work To Perform: _____ Contact:_____
_____ Telephone:_____ Fax: _____

A. Workers Compensation Insurance Experience – Please provide your Experience Modification Rate (EMR) for each of the preceding 3 years.

Year	EMR [1]	Insurance Carrier	Policy No.

If your EMR was greater than 1.0 in any of the three preceding years, please attach a summary description of all worker's compensation claims, showing the type of accidents and how they happened, the resulting injuries and loss amounts (for each of the preceding 3 years).

B. Accident, Incident and Injury Experience – Please provide the following information to help us evaluate your injury experience during each of the preceding 3 years.

Year	# of Lost Workday Cases	# of Medical Treatment Cases	# of Fatalities	Total # Injuries and Illnesses	Total Work Hours	Total Case Incidence Rates [2]
MSHA Cases						
OSHA Cases						

If your MSHA Total Case Incident Rate was above the most recently published rate for your industry (_____) or your OSHA Total Case Incident Rate was above the most recently published rate for your industry (_____), please attach a summary description of all incidents that have occurred during the preceding 3 years. The information should include all blasting incidents, crane accidents, haulage accidents, and other incidents causing injury or damage to third parties. Briefly describe what happened and the loss amount for each.

C. MSHA and OSHA Citation Experience – Please attach a summary description of all MSHA and OSHA citations received during the preceding 3 years. The information should show standards allegedly violated, a brief description of the standard, the type of action (willful, S&S, serious, failure to abate, unwarrantable failure, etc.), and proposed penalties.
In lieu of providing summaries, you can provide copies of citations and assessments.

D. Statutory Safety Program Documentation – Do you have a written safety program that addresses the following:

Program	Yes	No
Head protection	☐	☐
Eye protection	☐	☐
Hearing protection	☐	☐
Respiratory protection	☐	☐
Safety harnesses, belts, and lines	☐	☐
Scaffolding, working at elevations	☐	☐
Housekeeping	☐	☐
Fire prevention/fire protection	☐	☐

Program	Yes	No
First Aid	☐	☐
Hazard Communication	☐	☐
Emergency procedures	☐	☐
Signs, barricades, flagging	☐	☐
Perimeter guarding	☐	☐
Electrical safety	☐	☐
Rigging and crane safety	☐	☐
Personal Protective Equipment	☐	☐

E. Environmental –

	Yes	No
Have you experienced any environmental incidents that required regulatory agency notification in the past 3 years?	☐	☐
Have you received any environmental violations in the past 3 years?	☐	☐

Please attach a summary describing the incidents or violations. The information should include: Date of incident or violation, agency involved, and penalties paid. In lieu of providing summaries, you can provide copies of violations and confirmation of reporting.

F. Training Plans [3] –

Please provide verification that every employee who will be working on the project has received all new miner, annual refresher, and task training under 30 CFR Part 46 or 30 CRF Part 48 (underground) if applicable and all training required by 29 CFR 1910 or 1926 (OSHA) if applicable.

	Yes	No
Do you have approved MSHA Training Plan to 30 CFR Part 46 Standards if you will work in a Surface Mine or in a Sand & Gravel Pit?	☐	☐
Do you have approved MSHA Training Plan to 30 CRF Part 48 Standards if you will work in an Underground Mine, including the surface areas of the Underground Mine?	☐	☐
Do you have a training plan for all training required by 29 CFR 1910 or 1926 (OSHA) if applicable?	☐	☐
Are the employees that will work on our sites current in their training?	☐	☐

G. Drug and Alcohol Testing Program –

	Yes	No
Does your company have a written Drug and Alcohol Testing Policy?	☐	☐

---

[1] Companies with an EMR of >1.0 in the last three years must provide detail of their claims for review by a designated Safety Representative.

[2] Companies with an MSHA Total Case Incident Rate was above the most recently published rate for your industry (_____) or your OSHA Total Case Incident Rate was above the most recently published rate for your industry (_____), must provide a summary description of all liability incidents that have occurred during the preceding 3 years and must provide detail of their claims for review by a designated Safety Representative.

[3] Companies must show evidence that they have a training plan that has been reviewed and approved by MSHA.

	Review	Name / Signature	Date
☐	This vendor has been reviewed by Procurement or Project Management and is approved for use.		
☐	This vendor has been reviewed by a designated Safety Representative and is approved for use		
☐	This Vendor is not approved for use on sites		

Suggested Documents for **INDEPENDENT CONTRACTOR** to keep on-site in a "Site Binder"

-Originals to be kept in a secure office location

1. Copy of the Training Plan (the Plan may be kept in the office nearest mine and must be provided to MSHA on the day following request).
2. Training Certificates- these must be provided by the Mine Operator on the same day as requested by MSHA. Keep copies on-site and originals in a secure location.
    a. New Miner Training/Newly Employed Experienced Miner Training
    b. Task Training
    c. Annual Refresher Training
    d. Site-Specific Hazard Awareness Training- **provided by mine operator/company**
    e. First Aid provider "cards" (these are "training certificates")
    f. If applicable, have copies of annually required Part 62 Hearing Conservation Program training documentation and the annual "offer or annual audiogram" documentation.
3. Part 47 HazCom Program ("Workers Right To Know")- has to be on-site and accessible to miners (have a backup copy in a secure location in case the on-site copy gets lost or damaged)
    a. Written Program
    b. List of hazardous materials on-site
    c. MSDS or SDS for each hazardous material on-site
4. Copies of most recent Quarterly Reports
    a. Originals need to be kept for 5 years – keep in a secure location
5. Daily Workplace Exam documentation
    a. Records must be kept for 1 year – Suggestion: Keep the current month on-site and previous months could be stored in a central location.
6. Pre-shift examination of mobile equipment – defects need to be reported to supervisor **and documented if not immediately repaired.**
    a. Documentation of defects is required to be kept on-file until the defect is corrected
    b. Suggestion – be in the habit of documenting the pre-shift exam of equipment: require daily documentation of equipment pre-shift exams and keep them with the required Daily Workplace Exams.
7. Verification of the monthly fire extinguisher exam and annual fire extinguisher maintenance – the tag on the fire extinguisher documents the date of the annual maintenance exam and the tag can also be used to document the monthly exam.
    a. Suggestion – create a form to "double-document" the extinguisher exams in case a tag gets lost.
8. Post the required Emergency Phone List.
9. If applicable, the most recent documentation of electrical grounding test data (signed and dated)

APPENDIX H: DISTRACTIONS AUDIT

1. Addressing Distractions on Mine Sites: A Facility Self-Audit Guide

Addressing DISTRACTIONS on Mine Sites

A FACILITY SELF-AUDIT GUIDE

Distractions on mine sites can be deadly. The scale and power of equipment used, coupled with ever-changing site conditions, requires complete and undivided attention be given to the task being performed. The aggregates industry goes to great efforts to train miners about the hazards associated with mining – but even years of excellent training can be undone with just seconds of distraction. Distractions can, and do, result in catastrophes that cause major damage, severe injuries, and death.

This self-audit guide accompanies NSSGA's "Addressing Distractions on Mine Sites" poster. On the following pages you will find a series of questions to help guide facilities in identifying current practices around distractions and where improvements can be made. This downloadable document can be used so facilities can systematically work through the audit section-by-section with their teams and are encouraged to include employees from all operational levels. The audit can be done annually or bi-annually to reassess programs and track changes over time.

*Disclaimer

The NSSGA materials for "Addressing Distractions on Mine Sites", including this document, are to be used as a general guide and are not intended as a sole source of information, nor are they intended to provide legal advice. Users are encouraged to seek technical advice from qualified professionals familiar with individual sites, safety programs, tasks and company policies and procedures. NSSGA is not responsible for any acts or omissions taken by any party using this document for reference.

NSSGA®
NATIONAL STONE, SAND & GRAVEL ASSOCIATION

Find additional resources on NSSGA's Health & Safety webpage at: nssga.org/distractions

PLANNING:

1. *What messages do we send as a company that address distraction in the workplace?*

How and when are these messages communicated?

2. ***Do we have a multidisciplinary team dedicated to planning activities such as addressing distraction in the workplace?*** ☐ YES ☐ NO

IF YES: *How often does this team meet? What previous work have they engaged in? What are their current goals? How can the team improve and how can management support the team?*

IF NO: *Who would we include on such a team? (E.g., what departments and roles should be included?) When should the team meet and how frequently?*

3. *What does the data show about our current incident trends? How could distraction play a role in these incidents?*

4. *What are our current safety practices/policies related to distraction?*

Do these practices/policies meet the needs of our workplace? YES NO

How can they be improved?

HAZARD IDENTIFICATION:

1. ***What are our policies around multi-tasking (e.g., texting and driving, use of cell phones, etc.)?***

How can these be improved?

2. ***Do we address distractions as part of our job hazard assessments?*** ☐ YES ☐ NO

3. ***What potential distractions exist for common jobs done at our facility?***

4. ***How do we encourage a culture where employees can talk about distractions and fatigue?***

How can we continue growing our company culture around distraction awareness?

TRAINING:

1. *Where do we address distractions in our training programs?*

How can we improve our training programs around distraction?

2. *How do we train and communicate about not being a distraction to one another on the job?*

3. *What materials do we have in our resource library that address distraction?*

What gaps are there in our resources?

4. ***Do we use nudges or other reminders to stay mindful while doing a task?*** YES NO

IF YES: *What are they? Are there others we should add?*

IF NO: *Where would nudges or other reminders be beneficial and what could they be?*

POLICIES AND PROCEDURES:

1. ***Do our existing policies and procedures emphasize the importance of maintaining focus on the task at hand?*** ☐ YES ☐ NO

2. ***What policies do we have around cell phone use, texting, fatigue, etc.?***

Are there gaps in our policies?

3. ***During incident investigations, do we include distraction or lack of focus as a contributing element?*** ☐ YES ☐ NO

IF YES: *Do we share our findings and use what we learned as a training tool and how do we keep from blaming or targeting individuals?*

IF NO: *How can we improve our investigation procedures to address distraction and share information without blaming or targeting?*

4. *Do we use "do not disturb" signs or barriers when specific tasks are ongoing (e.g., welding) to reduce distraction?* ☐ YES ☐ NO

IF YES: *Are there other tasks or situations where we should use signage to reduce distraction? Are there other types of signage that could be used?*

IF NO: *For what tasks or situations would such signs or barriers be valuable?*

CHECKING AND REVIEW:

1. ***Have we reviewed historical accident investigations to highlight where distraction could have been a contributing factor?*** ☐ YES ☐ NO

IF YES: *How can this information help inform our facility and improve safety?*

IF NO: *What do we think this data would show? How can we implement this?*

2. ***Have we reviewed near miss or near hit events to analyze what role distraction may have played?*** ☐ YES ☐ NO

IF YES: *How can this information help inform our facility and improve safety?*

IF NO: *What do we think this data would show? How can we implement this?*

3. *When do we have safety conversations?*

How do we ensure these conversations happen at the right time and do not themselves become a distraction?

4. *How do we address distractions during day-to-day operations?*

What could we add or change to improve and keep distraction awareness high?