Fire Panel Management

1. Purpose

1.1. The purpose of this policy is to provide guidelines when modifying the normal operation of a fire protection system. The probability of casualties and major structural damage increases when fire alarm and fire protections systems are impaired. The risk of damages and their severity increases the longer systems remain impaired. Therefore, it is necessary to minimize the duration and scope of any impairment. This document contains an effective management program used to minimize the risk associated with the fire alarm and fire protection impairments. This standard must be followed throughout all phases of work.

2. Scope

2.1. This policy covers any scope of work undertaken by BNBuilders or its subcontractors and their tiers where there is potential to disrupt a fire protection system as a result of our work throughout all phases of construction. This policy provides instructions to authorized individuals who wish to request or modify the normal operation of a fire alarm and fire protection systems during demolition and/or construction, outages, maintenance, testing and system impairments of occupied buildings. This document does not include guidance on hot work activities.

3. Responsibility

3.1. Subcontractor

3.1.1. Notifies BNBuilders Superintendent/Foreman at least 72 hours in advance that work activities require a system impairment.
3.1.2. Submits for an impairment permit from BNBuilders at least 72 hours prior to starting work.
3.1.3. Obtains a new impairment permit when the scope of work changes or to receive permit extensions. Permits are valid for one day only and will expire at the end of the business day unless specified by Superintendent. It is up to the discretion of BNBuilders designated competent person to issue permits on an individual basis prior to 72 hours' notice and extended permit period, as necessary.
3.1.4. Maintains a copy of the impairment permit at the work site and follows the requirements include on the document.
3.1.5. Contacts BNBuilders Superintendent/Foreman immediately in the event of a fire emergency.

3.2. Authorized/Competent Person (BNBuilders Employee)

3.2.1. Assists subcontractor with the impairment permit process.
3.2.2. Communicates the job details requiring fire alarm modification to Superintendent/Foreman.
3.2.3. Coordinates Service Response to assist and Announcement of impairment and shutdown notice.
3.2.4. Identifies and communicates the oracle charge string for fire watch activities when needed.
3.2.5. Functions as the authorized person responsible for contacting Facilities Management and Alarm Company when the building or area is ready to be placed "on hold" and placed back "online,"
3.2.6. Monitoring impaired building fire alarm systems,
3.2.7. Bringing fire systems back "online" when work is complete and inspecting and testing the fire alarm system.
3.2.8. Document's impairment details (i.e., devices impaired, point numbers, name of individual(s) performing impairment) in appropriate building log binder.
3.2.9. Updates a new log binder when necessary.

3.3. Superintendent or Designated Authorized Competent Foreman

3.3.1. Issues the completed impairment permit.
3.3.2. Issues updated permit as needed.
3.3.3. Provides new panel log binder when needed from SharePoint.
3.3.4. Maintains expired permits electronically for a minimum of duration of project.
3.3.5. May issue permits on an individual basis prior to 72 hours' notice.
3.3.6. Can extended permit period, as necessary.
3.3.7. Coordinates activities with facilities management.

4. Definitions

4.1. **Applicant** – An Approved person who is a Subcontractor filling out an impairment permit with BNBuilders Superintendent.
4.2. **Authorized Person-** Approved individual by BNBuilders who has specialized knowledge of the fire alarm systems, fire extinguisher operation and has completed fire watch training. This person is permitted to initiate an impairment permit application to work on the buildings fire alarm and fire protection systems.
4.3. **Fire Alarm Devices** - a set of electric/electronic devices/equipment working together to detect and alert people through visual and audio appliances when smoke/fire is present. These alarms may be activated from smoke detectors, heat detectors, water flow sensors, which are automatic or from a manual fire alarm pull station.
4.4. **Alarm Company** – Approved third party monitoring company.
4.5. **Subcontractor –** A person or persons who is performing work under a contract and is managing construction activities, which require the modifications of the buildings fire alarm or fire protection system.
4.6. **Disabling Devices** – Disabling or "turning off" specific alarm initiating devices and/or signals by using the fire alarm control panel function keys, while allowing the rest of the alarm system to remain active.
4.7. **Disabling Panel** – Any panel alteration that prevent it from receiving inputs or communicating alarms. Disabling an entire panel is not permitted without Superintendent authorization.
4.8. **Safety Department** – Safety Director, Regional Safety Manager, Safety Manager and Safety Engineer.
4.9. **Emergency Impairment** – An unexpected system failure.
4.10. **Fire Alarm Panel Watch** – An authorized individual or individuals whose sole responsibility is to monitor the fire alarm panel for activation of a fire alarm signal(s).
4.11. **Fire Alarm System -** A system, or portion of a combination systems consisting of devices (i.e., smoke and heath detectors) arranged to monitor and annunciate the status of a fire emergency and then to initiate the appropriate response to those signals.
4.12. **Fire Protection System –** Approved devices, equipment's and systems or combinations of systems used to detect a fire, activate an alarm, extinguish, or control a fire, control, or manage smoke and products of a fire, or any combination thereof.
4.13. **Fire Watch –** Person(s) who's sole responsibility is to look for fires within a designated area or areas. He or she must have specialized training on fire alarm systems activation, fire extinguisher operation and fire watch training.
4.14. **Impairment –** Any loss of the fire alarm system functionality. Examples of impairment include:
4.14.1. Pump testing
4.14.2. Maintenance and repair
4.14.3. Disconnecting, bypass, or disabling signal circuits
4.14.4. Deactivating Alarm initiating devices.

4.14.5. System testing
4.14.6. Emergencies
4.14.7. Impaired fire alarm and fire protection equipment
4.14.8. Powering down the fire alarm control panel
4.14.9. A system "on hold" with the Alarm Company
4.14.10. Maintenance

4.15. Impairment Permit – A document completed and issued by Superintendent to an authorized person. The permit provides permission to impair whole or part of a fire alarm system.

4.16. Record of Fire Alarm Device (Log binder) – A log binder used by an authorized person to document fire alarm system impairments and the type of work activities performed.

4.17. On Hold or On Hold for Testing (System on Test)– A condition in which the communication between the fire alarm panel and Alarm Company has been suspended, the start of a system impairment.

4.18. Online – A condition in which the communication between the fire alarm panel and Alarm Company has been restored, the end of a system impairment.

4.19. Outage – A condition in which the power supply to the fire alarm panel or other fire alarm devices is not available, it has been bypassed or the signal circuit is disabled.

5. Procedure

5.1. Fire Panel Impairment

5.1.1. ***Impairment***

5.1.1.1. Usually, construction dust is the primary trigger of false alarms by activating a local smoke alarm. In lieu of disabling the smoke detector(s) and/or fire alarm system, alternate detection and notification systems are recommended. These alternate systems must be approved by Superintendent/Foreman before implementation. If the fire alarm system needs to be impaired, the Contractor must provide at least 72-hour notice to Superintendent. This advanced notice will allow for planning, coordination and obtaining an impairment permit. Only authorized personnel are permitted to interface or impair a building fire alarm panel and fire protection system.

5.1.2. ***Planning for Impairment:***

5.1.2.1. During impairment planning, the contractors Superintendent/Foreman performing work will notify the project team of the planned impairment. This should include the scope and duration/ extent of the impairment, and the precautions put in place.

5.1.2.2. When the impairment duration will last longer than 12-hours within a 24-hour period:

5.1.2.3. The Superintendent/Foreman shall:
5.1.2.3.1. Evacuate the building or the portion of the building affected by the system impairment or schedule with Building Management to utilize an approved fire watch.
5.1.2.3.2. Follow BNB Hot Work program and account for any dust control measures (JHA, Pre-Task Plan).
5.1.2.3.3. Notify occupied spaces on the same alarm system of the impairment.

5.1.3. ***Initiating an Impairment.***

5.1.3.1. Impairment permits are obtained through General Contactor Authorized/Competent person or Superintendent. All permits are valid for 1-day only, and will expire at the end of the business day, unless:

5.1.3.1.1. Requested and been approved for an extension by Superintendent/Foreman, up to one week.
5.1.3.1.2. The impairment is within an active construction site with an operational fire monitoring system, or the Subcontractor/ General Contractor is requesting the permit for monthly testing purposes, in which case the permit will be valid for 1-week.

5.1.3.2. The completed permit and impairment details will be shared with BNBuilders and the Owner upon request.

5.1.3.3. An authorized person (i.e., Foreman or competent individual) will update the panel logbook with impairment information daily.

5.1.3.4. An Authorized Person (i.e., Foreman) will maintain oversight of the impaired building's fire alarm system, and work with the Sub-Contractors to ensure appropriate procedures are followed throughout the impairment.

5.1.3.5. If the project plan or scope changes at any time during the project and the planned impairment is affected, the Authorized/Competent person must coordinate with Facilities Management to appropriately adjust the system impairment. An updated impairment permit must be obtained by the Contractor/ Sub-Contractor, to update these changes. The pre-task plan must be updated to reflect this change of scope.

5.1.4. Terminating an Impairment.

5.1.4.1. As soon as the impairment is no longer required, the authorized person will have all fire alarm and fire protection systems ready to be back to an operable state.

5.1.4.2. Once the system has been verified that it is functioning correctly, the Superintendent/Foreman shall be notified that the system has been restored.

5.1.4.3. Notify Facilities Management that the job is complete, and system has been restored. Authorized/Competent person will contact the Alarm Company and request that the building be placed back "online".

5.1.5. Emergency Impairment:

5.1.5.1. In the event of an unexpected system failure where the fire alarm and/or protection system cannot notify the building occupants, Authorized person will notify Project Superintendent/Foreman and other Contractors. Following the Emergency Response Plan for that specific project the team will perform one of the following:

5.1.5.1.1. Evacuate the building affected by the system impairment.
5.1.5.1.2. Have an authorized person function as an approved fire watch.

5.1.5.2. Sub-Contractor will continue to retain the responsibility of notifying the Superintendent of the impairment and in turn, the Authorized person will contact the alarm company. If the emergency is anticipated to last longer than 12-hours in a 24-

hour period Superintendent will Notify local Fire and EMS of the emergency. An impairment permit must be obtained as soon as possible.

5.1.6. Building Impairment Notifications:

5.1.6.1. Contact building owner/ management to coordinate impairment notification plan as required.

5.2. Jobsite Requirements

5.2.1. Request a site visit from the local fire department as soon as practical to acquaint them with the project and to identify any special hazard considerations. Request additional fire department visits throughout construction as deemed necessary. Allow Fire Department to explain the response process during an FAC (Fire Alarm Commercial) call type.

5.2.2. Programming and troubleshooting a system like this will still need to be done at the main fire alarm control panel.

5.2.3. Reference the Method of Procedure document to develop a site-specific fire panel management plan.

5.3. Training

5.3.1. Authorized/Competent individual must be knowledgeable on the BNBuilders Fire Panel Management and Fire Prevention Policies along with a review or walk through of the Fire Alarm System by the buildings installer or building management prior to the start of construction. If possible, it is recommended to have additional individuals (backups) trained on the system as well.

5.3.2. A review or walk through must be conducted prior to initial assignment and annually thereafter or whenever there is a change in the Emergency Response Plan or new equipment is introduced.

6. References

Cal/OSHA Title 8, Subchapter 4, Article 36 - Fire Protection and Prevention

NFPA 10

L&I WAC 296-24-585 to 296-58503 – Fire Protection

L&I WAC 296-24-592 to 296-24-63599 – Fire Suppression Equipment

Specific codes referenced during the development of this policy include:

- NFPA 25 for the impairment of sprinkler systems
- NFPA 72 for the impairment of the fire alarm syste

Fire Prevention

1.0 Purpose

1.1. The purpose of this standard is to reduce or eliminate potential fire hazards in the workplace and to provide procedures for rapid and effective responses should a fire occur.

2.0 Scope

2.1. This standard applies to all BNB projects where personnel carry out work that has the potential to cause fire. This standard must be followed throughout all phases of work.

3.0 Responsibility

3.1 Project Management

3.1.1. BNB Project Management & Supervision must ensure that adequate fire protection equipment is available on site and inspected as required. BNB Project Management & Supervision are to ensure adequate housekeeping of the project and must also ensure that personnel conducting work are adequately trained by their employer(s) in fire protection, firefighting equipment, safe work practices, and regular inspection of work areas.

3.2 Workers

3.2.1. Workers are responsible for engaging in safe work practices such as proper housekeeping and hot work procedures to prevent the occurrence of fire. Workers are responsible for knowing the types of combustible and flammable materials used in their areas and taking the proper precautions to control fire hazards.

4.0 Definitions

4.1. **Combustible liquid** - any liquid having a flash point at or above 140 deg. F (60 deg. C), and below 200 deg. F (93.4 deg. C).

4.2. **Combustion -** means any chemical process that involves oxidation sufficient to produce light or heat.

4.3. **Fire Alarm Devices** - a set of electric/electronic devices/equipment working together to detect and alert people through visual and audio appliances when smoke/fire is present. These alarms may be activated from smoke detectors, heat detectors, water flow sensors, which are automatic or from a manual fire alarm pull station

4.4. Fire Classes:

4.4.1. **Class A.** Fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics.

4.4.2. **Class B.** Fires in flammable liquids, gases, and greases.

4.4.3. **Class C.** Fires which involve energized electrical equipment where the electrical non-conductivity of the extinguishing media is of importance. (When electrical equipment is de-energized, extinguishers for Class A or B fires may be used safely.)

4.4.4. **Class D.** Fires in combustible metals, such as magnesium, titanium, zirconium, sodium, and potassium.

4.5. **Flammable Liquid** - a liquid having a flash point below 100o F (37.8o C) and having a vapor pressure not exceeding 40 pounds per square inch (absolute) at 100o F (37.8o C) and shall be known as a Class I liquid. Class I liquids shall be subdivided as follows:

4.6. Flammable Liquid Classes:

4.6.1. Class IA shall include those having flash points below 73F (22.8C) and having a boiling point below 100F (37.8C).
4.6.2. Class IB shall include those having flash points below 73F (22.8C) and having a boiling point at or above 100F (37.8C).
4.6.3. Class IC shall include those having flash points at or above 73F (22.8C) and below 100F (37.8C).
4.7. Flammable - capable of being easily ignited, burning intensely, or having a rapid rate of flame spread.
4.8. Fire resistance - the amount of resistance of a material or construction to fire.
4.9. Flash point - the temperature at which vapor is given off sufficient to form an ignitable mixture with the air near the surface of the liquid or within the vessel.
4.10. Safety Can - a container not more than 5 gallons in capacity with a flash-arresting screen, spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.
4.11. Sprinkler System - an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The installation includes a water supply, such as a gravity tank, fire pump, reservoir or pressure tank and/or connection by underground piping to a city main.
4.12. Standpipes - a water pipe for supplying the fire hoses of a building, connected with the water supply of the building and usually with a fire department connection (FDC) outside the building.

5.0 Procedure

5.1 Fire Prevention

5.1.1 General:

5.1.1.1. The applicable pages in the Crisis Management Plan must be completed for the project.
5.1.1.2. Drills should be conducted frequently as determined by project management.
5.1.1.3. Maintain good housekeeping to reduce fire hazards and to provide safe routes of egress should a fire occur.
5.1.1.4. Conduct periodic workplace inspections to identify fire hazards such as unnecessary accumulation of combustibles (including paper and boxes), unnecessary storage of flammables, and sources of ignition.

5.1.2 Ignition Hazards:

5.1.2.1. Electrical wiring and equipment for light, heat, or power purposes will be properly installed.
5.1.2.2. Equipment powered by internal combustion will be located with the exhausts positioned away from combustible materials.
5.1.2.3. Smoking is prohibited at or in the vicinity of operations that constitute a fire hazard. Such areas will be conspicuously posted as follows: "NO SMOKING OR OPEN FLAME."
5.1.2.4. Portable, battery-powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, will be approved for the hazardous locations.

5.1.3 Temporary Heating Devices

5.1.3.1. Ventilation
5.1.3.1.1. Fresh air will be supplied in sufficient quantities to maintain the health and safety of employees. Where natural means of fresh air supply are inadequate, mechanical ventilation will be provided.
5.1.3.1.2. Heaters used in confined spaces necessitate that special care be taken to provide sufficient ventilation to ensure proper combustion, maintain the health and safety of workmen, and limit temperature increase in the area.
5.1.3.2. Clearance and Mounting: Temporary heating devices will be installed according to manufacturer's instructions.

5.1.3.3. Stability: When in use, heaters will be set horizontally level, unless otherwise permitted by the manufacturer's instructions.

5.2 Fire Protection

5.2.1. Access to available firefighting equipment must be maintained at all times.
5.2.2. Firefighting equipment must be inspected monthly and maintained in operating condition. Defective equipment must be immediately replaced.
5.2.3. Fire extinguishers that are out of service or discharged must be immediately tagged, removed from service, and replaced.
5.2.4. Firefighting equipment shall be conspicuously located and not obstructed from view in the workplace.
5.2.5. A temporary or permanent water supply of sufficient volume, duration, and pressure as required to properly operate the firefighting equipment will be made available as soon as combustible materials accumulate as directed by Authorities Having Jurisdiction (AHJ).
5.2.6. Where underground water mains are to be provided, they will be installed, completed, and made available for use as soon as practicable.

5.2.1 Fire Hose and Connections:

5.2.1.1. One hundred feet, or less, of 1.5-inch (3.75-cm) hose, with a nozzle capable of discharging water at 25 gallons (95 liters) or more per minute, may be substituted for a fire extinguisher rated not more than 2A 20BC in the designated area, provided the hose line can reach all points in the area.
5.2.1.2. If fire hose connections are not compatible with local firefighting equipment, adapters or equival ent to permit connections must be provided
5.2.1.3. During demolition involving combustible materials, charged hose lines supplied by hydrants, water trucks with pumps or equivalent will be made available.

5.2.2 Fixed Firefighting Equipment:

5.2.2.1. Sprinkler Protection

5.2.2.1.1. Where BNB is involved in the construction of a facility in which automatic sprinkler protection is required, the installation of the sprinklers will closely follow the construction, and sprinklers will be placed into service as soon as practicable or as AHJ's direct.
5.2.2.1.2. Where BNB is involved in the demolition or alteration of a facility, existing automatic sprinkler installations should be retained in service as long as reasonable. Only authorized persons will permit the operation of sprinkler control valves. Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves will be checked daily, at the close of work/business, to ascertain that the protection is in service

5.2.2.2. Standpipes

5.2.2.2.1. In all structures in which standpipes are required, or where standpipes exist in structures being altered, they shall, unless replaced by temporary construction protection, be brought up as soon as applicable laws permit, and shall be maintained as construction progresses in such a manner that they are always ready for fire protection use.
5.2.2.2.2. Standpipes will be provided with Siamese fire department connections on the outside of the structure, at the street level and shall be conspicuously marked and accessible.
5.2.2.2.3. Each floor will be equipped with at least one standard hose outlet
5.2.2.2.4. Systems shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring.
5.2.2.2.5. Temporary standpipes in buildings under construction shall be installed and operable according to AHJ's.

5.2.2.3. Fire Alarm Devices

5.2.2.3.1. An alarm/alert system (e.g., telephone system, siren, air horns, etc.) will be established to alert both the employees on the site and the local fire department of an emergency according to the Project's Crisis Management Plan.
5.2.2.3.2. The applicable pages from the Project's Crisis Management Plan will be conspicuously posted on site.

5.2.2.4. Fire Cutoffs

5.2.2.4.1. In new construction, firewalls and exit stairways required for the completed buildings will be given construction priority.
5.2.2.4.2. Fire doors, with automatic closing devices, will be hung on openings as soon as practicable.
5.2.2.4.3. Fire cutoffs will be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

5.3 Jobsite Requirements

5.3.1. BNBuilders provides and maintains general duty fire extinguishers on every jobsite per OSHA Standards. In addition, subcontractors provide their own activity appropriate type and size fire extinguisher protection as applicable.
5.3.2. Locate dumpsters twenty (20) feet or more from buildings except when located beneath a trash chute.
5.3.3. Request a site visit from the local fire department as soon as practical to acquaint them with the project and to identify any special hazard considerations. Request additional fire department visits throughout construction as deemed necessary.
5.3.4. Provide a temporary fire standpipe pump to ensure an adequate water supply for the fire department when a high-rise structure exceeds the height to which the local fire department's equipment has the unassisted capacity to reach. (Verify pumping capacity/requirements with the local fire department.)
5.3.5. In addition to system alarms and frequent inspections, a standpipe monitoring system is recommended to monitor the readiness of the temporary standpipe system.
5.3.6. Provide an Emergency Evacuation Notification (Alarm) System to efficiently alert all workers on the project. Test the system monthly and conduct mock evacuation drills at least once every six months.
5.3.7. Hot work must be done in accordance with Welding, Cutting, & Hot Work.
5.3.8. Only approved metal safety cans with self-closing lids and spark arresting screens are to be used for the storage of flammable and combustible liquids outside of the manufacturer's container.
5.3.9. The telephone number of the nearest organized firefighting group/department shall be written in the Crisis Management Plan for the project.

5.3.10 Extinguisher Requirements, Placement, and Inspection:

5.3.10.1. Use only UL-listed extinguishers.
5.3.10.2. Extinguisher locations shall be marked on the project's Site Logistics' Plan.
5.3.10.3. Place extinguishers in conspicuous locations, along normal paths of travel, and near exits as noted on the Site Logistics Plan. If the extinguishers are not readily visible, use wall markings, signs, or lights to identify their locations.
5.3.10.4. A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the floor area, or fraction thereof. Where the floor area is less than 3,000 square feet, at least one extinguisher shall be provided. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed AHJ's regulations (California-75 ft. Federal, Washington, & Oregon-100 ft.).
5.3.10.5. Ensure that extinguishers are readily accessible.
5.3.10.6. Keep the space in front of and below extinguishers clear at all times. The floor area beneath extinguishers may be marked as a reminder to keep the area clear.
5.3.10.7. Provide the appropriate number and types of fire extinguishers for operations being performed.
5.3.10.8. Properly trained personnel will inspect extinguishers at least monthly. The monthly inspection will include the following items at a minimum:
5.3.10.8.1. Location

5.3.10.8.2. Rating
5.3.10.8.3. Access
5.3.10.8.4. Visibility
5.3.10.8.5. Operating Instructions
5.3.10.8.6. Seals
5.3.10.8.7. Tamper Indicators
5.3.10.8.8. Fullness
5.3.10.8.9. Physical Condition
5.3.10.8.10. Attach inspection tags to each extinguisher. Tags should be marked with dates of inspection, testing, and recharging, and the initials of the inspector.
5.3.10.8.11. Fire extinguishers must be inspected annually by a qualified fire services contactor.
5.3.10.8.12. Material storage areas will be equipped with fire extinguishers adequate for their size, construction, and the material stored therein.
5.3.10.8.13. Extinguishers are to be adequately maintained with monthly inspections and yearly recharge dates marked on each extinguisher's tag.

5.4 Hazards

Fire Hazards	Potential Consequences
Flammable liquids, gas, diesel fuel, etc.	• Fire / Explosion • Personal Injury / Illness • Property Damage
Inadequate training/job planning	• Insufficient knowledge of tasks/products • Lack of coordination of work • Fire / explosion • Personal injury/illness • Property damage
Incorrect / inappropriate use of tools or equipment	• Fire / explosion • Personal injury/illness • Property damage
Insufficient firefighting equipment	• Fires/explosion uncontrolled • Personal injury/illness • Property damage
Mixing chemicals	• Chemical incompatibility • Fire / explosion • Personal injury/illness • Property damage
Poor housekeeping, incorrect storage and handling of materials	• Materials exposed to ignition source • Fire / explosion • Personal injury/illness • Property damage
Sparks, flames, excess heat	• Fire / explosion • Personal injury/illness • Property damage

5.5 Hazard Controls

5.5.1 Engineering Controls:

5.5.1.1. Fire engineers may be enlisted to assist architects, building owners and developers in evaluating buildings' life safety and property protection goals. Fire engineers will ensure compliance with NFPA 10 codes.

5.5.1.2. The following are additional engineering controls related to fire prevention/protection:

5.5.1.2.1. Substituting flammable/combustible products with less hazardous
5.5.1.2.2. Use of self-closing and grounded flammable storage cabinets
5.5.1.2.3. Use of flammable waste containers with self-closing lids
5.5.1.2.4. Availability of standpipes and connections
5.5.1.2.5. Use of double-walled tanks for flammable liquid containment
5.5.1.2.6. Availability of spill clean-up kits for flammable liquids
5.5.1.2.7. Bollards to protect propane/fuel tanks located in an area where they could be struck by a vehicle

5.5.2 Administrative Controls

Some examples of administrative controls related to fire prevention/protection may be:

5.5.2.1. Moving hot work into safer areas away from flammable/combustible materials
5.5.2.2. Handle/Store/Use flammable/combustible materials according to SDS
5.5.2.3. The availability and use of fire protection equipment (blankets, curtains, etc.)
5.5.2.4. Signage indicating storage/use of flammable/combustible materials

5.6 Training

5.6.3. Where fire extinguishers are provided for use, the employer will provide training on general principles of portable fire extinguishers, including stages of fires and classes of fire extinguishers with an emphasis on hazards of fighting a fire during the initial phases of a fire.

5.6.4. Training must be conducted prior to initial assignment and annually thereafter or whenever there is a change in the Crisis Management Plan or new equipment is introduced.

6.0 References

Cal/OSHA T8CCR1920 - 1938 – Fire Protection and Prevention

Fed/OSHA 29CFR1910, Subpart L – Fire Protection

NFPA 10

L&I WAC 296-24-475 to 296-24-47517 – Storage and Handling of Liquefied Petroleum Gases

L&I WAC 296-24-585 to 296-58503 – Fire Protection

L&I WAC 296-24-592 to 296-24-63599 – Fire Suppression Equipment

7.0 Attachments

Hot Work Permit

Demolition Permit

Confined Space Permit

First-Aid CPR

1.0 Purpose

The purpose of this policy is to provide guidelines for first aid treatment, training, and supply requirements on all BNB projects.

2.0 Scope

The scope of this policy covers all BNB projects, equipment yards, and offices.

3.0 Responsibility

3.1 Management and Supervision

Supervisory personnel must maintain current First Aid / CPR certifications by attending training every 2 years or as required by the certifying agency.

All crew leaders, supervisors, or persons in direct charge of one or more employees must have a valid first-aid certificate. A person holding a valid first-aid certificate must be present on the job site any time a crew is present.

4.0 Definitions

CPR- Cardiopulmonary Resuscitation is an emergency procedure that combines chest compressions often with artificial ventilation to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing in a person who is in cardiac arrest.

AED - An automated external defibrillator (AED) is a portable device that checks the heart rhythm and can send an electric shock to the heart to try to restore a normal rhythm. AEDs are used to treat sudden cardiac arrest (SCA). SCA is a condition in which the heart suddenly and unexpectedly stops beating.

5.0 Procedure

5.1 First Aid Supplies

- Adequate first aid supplies must be readily available on all jobsites.
- The contents of the kit must comply with Cal-OSHA CSO 1512 or WAC 296-800
- The contents of first aid kits will be inspected by BNB Supervisor on a weekly basis and restocked as necessary.

5.2 First Aid Treatment

- First aid trained individuals with valid credentials may provide treatment for minor medical issues on site.
- For more serious non-emergency treatment, an on-site medical treatment provider approved by the BNB Safety Director may be called.
- Non-life-threatening injuries requiring offsite medical evaluation and/or treatment shall be routed to the closest clinic in accordance with the site emergency management plan. The BNB Drug and Alcohol Policy shall be referred to for post-incident screening.
- Injured workers must be accompanied by a foreman or supervisor to the offsite clinic.
- Any injury, regardless of severity or treatment received, must be documented on an incident report form, and reported to the Safety Department.

5.3 Other Requirements

- At least one basket or equally appropriate litter equipped with straps and two blankets, or other similar warm covering, shall be provided for each building or structure five or more floors or 48 or more feet above or below ground level.
- Signage must be posted and easily visible, indicating the location of first aid kits, AED, stretcher basket and blanket.
- Maps with emergency contact numbers and directions to the nearest clinic and hospital will be located on the Jobsite Safety Board.

6.0 References

FED/OSHA 1910.26 – First-aid and CPR Training

CAL/OSHA Title 8 Subchapter 4 Article 3 – Emergency Medical Services

L&I WAC 296-800-150 – First Aid

7.0 Attachments

Incident Report Form

Near Miss Form

Forklifts

1.0 Purpose

1.1. The purpose of this standard is to define the procedures that apply to the care, control, maintenance, inspection, and operation of a powered industrial trucks, forklifts, etc.

2.0 Scope

2.1. This standard applies to all operations that require the use of powered industrial trucks which may include forklifts, tele-handlers, rough-terrain forklifts, straight mast, motorized hand trucks, tractors, platform lift trucks, and other specialized industrial trucks powered by electric or internal-combustion engines.

3.0 Responsibility

3.1 Project Management

3.1.1. Project Management and Supervision must ensure:

3.1.1.1. Forklift operators provide documentation of training.
3.1.1.2. Forklift operators pass the BNB Forklift test to verify competency (BNB).
3.1.1.3. Safe operation through frequent observations of forklift operations.

3.2 Operators

3.2.1. Operators must complete documented inspections of powered industrial trucks daily, stay within the limits of the machine, know the weight of the loads to be carried, and always operate equipment in a safe manner.

4.0 Definitions

4.1. Forklift – Powered Industrial Truck used to carry, push, pull, lift, stack or tier materials. Most common is the type 4 internal combustion engine with solid tires.
4.2. Powered industrial truck (PIT) - a mobile, power-driven vehicle used to carry, push, pull, lift, stack, or tier material.
4.3. Tele-handler – Also called "Rough Terrain" or "Extended Reach" or "Type 7" because of the telescopic boom. These forklifts are similar to cranes in that they extend and elevate loads, often requiring outriggers. Additional discussion, evaluation and training specific to their hazards and operation is required. Because they are used in rough terrain, and they can telescope the boom, tip overs are more of a concern.
4.4. Free Rigging – A method of lifting materials with a forklift by using a chain or other form of rigging (Slings, etc.) attached directly to the forks to lift material.

5.0 Procedure

5.1 Daily Inspections

5.1.1. Will be documented — an optional form that personnel may use if they don't have their own form. Any malfunction must be taken care of before the piece of equipment is put back into service.

5.1.1.1. Operators or their employer must provide a copy of their current certification. If they cannot produce one, they will not be allowed to operate the equipment until certification is attained.
5.1.1.2. A PTP must be completed each day that includes a listing of the weights of material to be moved and where in the load charts the weights fall.

5.1.1.3. "Free Rigging", the practice of hoisting equipment/material from forks, is not allowed-- Only manufacturer-approved attachments such as "truss-boom" attachments that have a load chart are permitted.
5.1.1.4. Chains, slings, and rigging used for hoisting must be inspected, tagged, and properly rated for the capacity to be lifted.
5.1.1.5. The operation of fuel-powered industrial trucks indoors or in enclosed areas must be done with adequate ventilation and air monitoring for poisonous gases such as Carbon Monoxide (CO).
5.1.1.6. BNB project personnel must review the attached "What to Look For" slide deck which lists warning signs that should alert us if we have an incompetent operator.

5.2 Hazards

5.2.1. Tipping is the greatest hazard with forklifts, and for that reason, additional training and testing is required before operators are approved to operate any forklift.

5.2.2. Struck-by hazards must also be controlled against to prevent personnel from being struck-by equipment or materials lifted/suspended by equipment. To aid in struck-by prevention, personnel must be physically separated from equipment operations.

5.2.3. Poisonous gases such as Carbon Monoxide (CO) may be emitted from powered industrial trucks which may potentially expose personnel.

5.3 Hazard Controls

5.3.1 Engineering Controls

5.3.1.1. Forklifts must be equipped with approved overhead protection at all times in addition to roll-over protection (ROPS).
5.3.1.2. Telescoping boom forklifts must be equipped with a convex rear-view mirror on the blind side of the machine.
5.3.1.3. Operators manual must be available for review by operators and supervisory personnel.
5.3.1.4. Capacities must be marked on the lift so it is clearly visible to someone in the operator's seat.
5.3.1.5. No use of propane-powered forklifts indoors or in confined spaces without adequate ventilation and air monitoring.
5.3.1.6. All equipment with a field of vision less than 270 degrees (i.e. rough terrain/all-terrain forklifts) will have a proximity alarm (this is different than the back-up alarm requirement). This alarm will have an audio and visual component. Proximity alarms will be installed in a position to best mitigate blind spots.

5.3.2 Administrative Controls

5.3.2.1. Controlled Access Zones must be set up around overhead/lifting activities.

5.3.2.2. Spotters must be used when traveling through congested areas, around blind spots, and at any time when the operator's vision may be hindered.

5.3.2.3. Operators must follow these rules:

5.3.2.3.1. Stop at all intersections
5.3.2.3.2. Yield to pedestrians
5.3.2.3.3. Face the direction of travel
5.3.2.3.4. Reduce speeds when turning

5.3.2.3.5. Sound your horn at blind corners
5.3.2.3.6. Keep a safe distance behind other trucks, do not drive side-by-side
5.3.2.3.7. Stop completely before backing up
5.3.2.3.8. Never park closer than 8 feet from the center of railroad tracks
5.3.2.3.9. Cross railroad tracks diagonally
5.3.2.3.10. When parking, place the forks on the ground and tilted forward. Set the parking brake and remove the key
5.3.2.3.11. When carrying a large of bulky load that obstructs visibility, the forklift is to be operated in reverse. Look where you are going
5.3.2.3.12. Do not lift unstable loads
5.3.2.3.13. Do not add counterweights to the forklift
5.3.2.3.14. Follow the manufacturer's instructions when driving up and down ramps. Keep the load uphill.
5.3.2.3.15. Never turn while still on a ramp
5.3.2.3.16. No riders are allowed
5.3.2.3.17. Never allow anyone to walk or stand under the uprights or a load
5.3.2.3.18. Note low clearance hazards such as pipes, sprinkler heads, doorways, etc.
5.3.2.3.19. Do not push or carry another disabled forklift with your forklift
5.3.2.3.20. Be aware of carbon monoxide hazards and if in an enclosed area subject to accumulation of carbon monoxide get an air monitor and test the air continuously.
5.3.2.3.21. Before entering a truck trailer or railroad car, make sure its brakes are set and wheels chocked.
5.3.2.3.22. Trailers not coupled to a tractor must have, in addition to its landing gear, fixed jacks
5.3.2.3.23. Always use a proper dock board with feet and handles. Steel plates can shift and are dangerous.
5.3.2.3.24. Avoid parking on an incline if possible. If necessary, wheels must be chocked.
5.3.2.3.25. If a forklift is to be used to elevate a work platform, use an approved safety platform with top rail, mid-rail, toe board, and attach platform properly with the moving parts of the mast protected. All other provisions as defined in the OSHA standards must also be followed.
5.3.2.3.26. Forklifts shall be equipped with back up alarms, and if operating on roads, a yellow warning light and slow-moving vehicle sign.
5.3.2.3.27. A 10 lb. ABC fire extinguisher must always be within reach of the operator.
5.3.2.3.28. If the powered industrial truck is unattended, the operator shall not exceed a distance of 25' away and the load must be lowered, controls in neutral, brakes set, and power shut off.

5.3.3 Personal Protective Equipment

5.3.3.1. Seat Belts must be worn at all times while in the operator's seat. Personnel working in the vicinity of powered industrial trucks must wear reflective vests.

5.4 Training

5.4.1. Training will consist of formal lecture, discussion, written and practical/hands-on exams. It can include videos, computer learning and written materials.

5.4.2. All forklift operators will receive training and provide documentation of that training before operating a Forklift.
5.4.3. Forklift operators shall be evaluated for training deficiencies every 3 years. The superintendent may accept the operator's previous training at his discretion.

5.4.4. Refresher training will be required under the following conditions;

5.4.4.1. The operator has been observed to operate the vehicle in an unsafe manner
5.4.4.2. The operator has been involved in an accident or near-miss accident
5.4.4.3. The operator is assigned to operate a different type of truck
5.4.4.4. The operator has received an evaluation that reveals he/she is not operating the truck safely.
5.4.4.5. A condition in the workplace changes in a manner that could affect safe operation of the truck.
5.4.4.6. Subcontractor employees may not operate any forklifts that are owned, rented or leased by BNB. If a subcontractor needs to use a BNB controlled forklift, a BNB employee will operate the forklift.

6.0 References

FED / OSHA 29 CFR 1910.178 – Powered Industrial Trucks

CALOSHA Title 8 Subchapter 7 Group 4 Article 25 – Industrial Trucks, Tractors, Haulage Vehicles, Earthmoving Equipment

L&I WAC 296-863 – Safety Standards for Forklifts and other Powered Industrial Trucks

7.0 Attachments

Forklift Training PowerPoint

Equipment User Agreement

Hand & Power Tools

1.0 Purpose

1.1. The purpose of this standard is to provide direction on use, maintenance, and inspection of hand and power tools used on BNB projects.

2.0 Scope

2.1. This standard applies to all hand and power tools used on all BNB projects. Power operated hand tools may be powered by electric, pneumatic, fuel, powder, or hydraulic means.

3.0 Responsibility

3.1 Project Management

3.1.1. When applicable, it is the responsibility of project management to ensure adequate submittals such as tool training cards and/or certifications are received from subcontractors. Project management and supervision must ensure that tool operators are adequately trained as required by tool manufacturers. For example, the following tools require specialized training and/or certification:

3.1.1.1. Powder actuated tools

3.1.1.2. Pneumatic tools

3.1.1.3. Compressed gas tools (impulse/combustion)

3.1.2. Supervision must ensure hand and power tool usage is compliant with regulatory and manufacturer requirements. Supervision must also ensure that adjacent workers are not affected by tool usage (noise, dust, ricochet, struck-by, debris, etc.). Supervision must enact controls to reduce tool operator and adjacent worker exposures.

3.2 Workers

3.2.1. Workers must be trained on the proper use, maintenance, and inspection of tools. When a defective tool is identified, workers must tag the tool as defective and remove it from service. Workers are responsible for posting signage/notification as required by tool manufacturers. Also, workers are responsible for following safe work practices such as proper tool selection and use.

4.0 Definitions

4.1. **Powder actuated tool** – a tool that utilizes the expanding gases from a power load to drive a fastener

4.2. **Pneumatic tools** – a tool that is driven by compressed air

4.3. **Powder actuated fastening system** - a method that uses a powder actuated tool, a power load, and a fastener

4.4. **Impulse/combustion/compressed gas tools** – uses disposable canisters of combustible gas in a combustion chamber to generate force which drives the object such as a nail, staple, etc.

5.0 Procedure

5.1 General Procedures for Hand and Power Tools

5.1.1. Ground Fault Circuit Interrupters (GFCI's) must be used with all electrical equipment.

5.1.2. Tool and extension cords are to be elevated above main walkways when feasible.

5.1.3. Cords are not to be routed through closed doorways.

5.1.4. Cords are not to be secured to metal or conductive objects/surfaces (i.e. studs, floor track, doorways, wire, etc.)

5.1.5. Adequate ventilation and monitors are required for the use of propane or other gas-fired devices indoors or in confined spaces.
5.1.6. Visually check all tools before each use for stress damage, insulation cuts or cracks, exposed conductors, missing grounds, slipped strain reliefs, damaged plugs, damaged switches, etc.
5.1.7. Damaged items must be tagged as defective and removed from the work area and be repaired by a qualified person.
5.1.8. Use the right tool for the job.
5.1.9. Guards and safety devices must be in place at all times.
5.1.10. Secure material when cutting with a saw.
5.1.11. Use the t-handles supplied by the manufacture when applicable.
5.1.12. Keep tools and cords clear of walkways.
5.1.13. Never use power tools if damaged or the ground pin is missing.
5.1.14. Don't lift or carry power tools by their cords.
5.1.15. Loose or frayed clothing or long hair, dangling ties, finger rings, etc. shall not be worn around moving machinery or other sources of entanglement.

5.1.16. The following tools and safety guidelines are to serve as a minimum standard for operation. Operators of tools must read and follow the tool manufacturer's manuals.

5.1.16.1 Air Hoses

5.1.16.1.1. All hoses exceeding 0.5-inch inside diameter shall have a safety device at the source of supply or branch line, which will automatically reduce pressure in case of a line failure. All connections, couplings, and splices in air lines exceeding 0.5-inch inside diameter shall be equipped with clips and wire rope or chain lashings. The clips and lashings shall be installed in a manner that prevents whipping of the hose line, should the connection coupling or splice fail.

5.1.16.1.2. Air hoses shall not be disconnected at compressors until air pressure has been bled off.

5.1.16.1.3. The manufacturer's safe operating pressure for hoses, pipes, valves, and fittings shall not be exceeded. Defective hoses, valves, and fittings shall be removed from service.

5.1.16.1.4. Compressed air shall not be directed at any part of the body. Compressed air shall not be used for cleaning purposes, except when reduced to less than 30 lb/in^2, and then only with effective chip guarding and the operator protected by applicable personal protective equipment.

5.1.16.1.5. Air hoses shall not be used for hoisting or lowering tools. Hoses shall not be laid on ladders, steps, scaffolds, or walkways in a manner creating a tripping hazard. Air hoses shall not be exposed to damage from vehicle or other traffic.

5.1.16.2 Chain Saws

Minimum personal protective equipment consists of:

5.1.16.2.1. leg protection/chaps,
5.1.16.2.2. proper footwear,
5.1.16.2.3. hearing protection
5.1.16.2.4. head protection
5.1.16.2.5. eye protection
5.1.16.2.6. face protection

5.1.16.3. Watch the tip of the blade and keep it from contacting other objects that can cause kickback. Kickbacks can be powerful, quick and severe, often to the face or upper body.
5.1.16.4. Ensure the blade is sharp and installed properly prior to use.

5.1.17 Circular Saws

5.1.17.1. Do not operate the saw if the lower guard does not move freely and close instantly when released. Do not pin the guard in an open position.

5.1.17.2. When provided with two handles and directed by the manufacturer, operators must use both handles on the saw. Operators must keep their entire body, including legs, behind the cutting area.

5.1.17.3. Sawhorses should be used when feasible with the stock (piece being cut) properly secured. Operators must not use the instep of their foot as a means to leverage material being cut.

5.1.18 Nailers

5.1.18.1. Electric or pneumatically driven nailers, staplers, and similar equipment provided with automatic fastener feed which operate at more than 100 lb./in^2 shall have a safety device on the muzzle to prevent the ejection of the fasteners unless the muzzle is in contact with the work surface. Adjacent workers must be protected from ricochet/struck-by hazards associated with the operation of the nailer.

5.1.19 Porta Bands

5.1.19.1. Use both hands to hold a Porta band when cutting. Do not hold material with the other hand-- use a vice.

5.1.20 Soil Compactors (aka Whacker)

5.1.20.1. Operators of soil compactors must wear adequate foot protection such as metatarsal foot guards

5.1.21 Jackhammers (including other powered hammers such as rotor)

5.1.21.1. Operators of jackhammers must wear proper protective equipment such as metatarsal foot guards, face shields, hearing protection, respiratory protection, anti-vibration hand protection, etc. as required by specific the operation. Rotation of personnel engaged in jackhammer operation may decrease risk for musculoskeletal disorders. Adjacent workers, personnel, and members of the public must be adequately protected from dust, noise, debris, etc. If feasible, water may be used to control dust at the source during operation.

5.1.22 Gas-Powered Saws (aka Cut-Off Saw, Demo Saw, Masonry Saw, Chop Saw)
The use of these saws requires additional PPE and safety considerations such as:

5.1.22.1. Hearing protection
5.1.22.2. Face and eye protection
5.1.22.3. Leg protection (chaps)
5.1.22.4. Foot protection
5.1.22.5. Respiratory protection
5.1.22.6. Fire protection

5.1.23 Coring tools

5.1.23.1. Operators of coring tools must be aware of hazards and procedures associated with penetrating surfaces. Prior to coring operations, utilities, energy sources, post-tensioned cables, etc. must be identified, marked out, and avoided. A controlled access zone must be established below coring operations to protect personnel from falling material/equipment. Operators must securely mount the coring tool to the surface being penetrated to avoid jerking of the tool during operation. Ladders should be avoided as a method of reaching the work area during coring tool operation—scaffolding or other work platforms are more suitable for this task. For reference, the Coring/Saw Cutting Operation Checklist may be used.

5.1.24 Hand-held cutting/grinding tools

5.1.24.1. Operators must wear adequate personal protective equipment with hand-held cutting/grinding tools such as **eye and face protection** (face shield and safety glasses), hand and arm protection, and respiratory protection. Guards must be used as required by the tool manufacturer. The appropriate disc must be used for the task (cutting vs grinding).

5.1.25 Pneumatic

5.1.25.1. An approved safety check valve must be installed at the manifold outlet to each supply line for hand-held pneumatic tools.
5.1.25.2. All pneumatic hose connections must be fastened securely.
5.1.25.3. Safety clips or retainers must be installed on all pneumatic tools to prevent the accidental expulsion of the tool from the barrel.

5.1.26 Powder Actuated Tools

The following three rules, if violated, may result in immediate termination.

5.1.26.1. Never point a tool at another person- loaded or not.
5.1.26.2. Never alter or override the safety features of a tool.
5.1.26.3. Never fire a tool into the air or at any surface unless the muzzle is firmly positioned against that surface per the manufacturer's specifications.

5.1.26.4. Operation of Powder Actuated Tools (PAT): The following operation rules must be followed to the letter. Violation of any one of them could be grounds for termination.

5.1.26.4.1. Never leave a PAT unattended.
5.1.26.4.2. Never load a PAT unless it is being prepared for immediate use.
5.1.26.4.3. Never attempt to load a fastener or powder charge into a PAT not designed for it (i.e. don't put Hilti charges in a Ramset unless they were meant for that tool).
5.1.26.4.4. Never drop power load magazines on the floor or work surfaces. Pick up all magazines.
5.1.26.4.5. Spent magazines are to be discarded in the trash. Magazines with unfired shots must be securely stored and disposed of accordingly.
5.1.26.4.6. Never attempt to transfer individual loads between several partially used magazines in an attempt to create full magazines.

5.1.26.5. PAT Protective Equipment and Procedures:

5.1.26.5.1. All powder-actuated tools must have muzzle shields attached to prevent from spalling, fastener ricochet, and powder burns. Any tool not so equipped must be immediately removed from service until it can be fitted with one.
5.1.26.5.2. Each operator must wear at a minimum:
5.1.26.5.3. Hearing protection with a Noise Reduction Rating (NRR) of at least 30.
5.1.26.5.4. Safety glasses
5.1.26.5.5. Hard hat
5.1.26.5.6. As a best practice, PAT operators may wear Anti-vibration gloves to protect against wrist and forearm injury from recoil. Also, face shields and long-sleeved shirts may provide additional protection if desired.

5.1.26.6. Prior to operating a PAT, the user must:

5.1.26.6.1. Ensure all adjacent workers are advised that powder-actuated tool will be in service and hearing protection should be used.

5.1.26.7. Powder Actuated Tools - Maintenance and Storage:

All tools loads and fasteners must be locked in a container or locker and stored in a safe place when not in use or more than 25 feet away, and be accessible only to authorized personnel.

5.2 Hazards

noise	crushing	damaged fasteners

dust struck-by electric shock flying objects debris sprains strains lacerations pinch points	falling objects caught-in fire explosion equipment malfunction incorrect use unqualified operators over use wrong tool for the task	improper storage improper/removed guarding unguarded moving parts missing handles improperly maintained equipment damaged components

5.3 Hazard Controls

5.3.1 Engineering Controls

5.3.1.1. When feasible, material should arrive on site ready to be installed/erected due to off-site fabrication/prep. This practice may eliminate or reduce the need for operations in the field such as extensive cutting of materials.

5.3.1.2. Digital modeling may be another method to reduce risk by avoiding utility conflicts, excessive work, unnecessary penetrations, etc.

5.3.1.3. To eliminate respiratory hazards or the need to wear respiratory protection, water or vacuum methods may be used for dust-generating operations.

5.3.2 Administrative Controls

5.3.2.1. Administrative controls regarding the use of hand and power tools may be the posting of warning signage, the establishment of controlled access zones, rotation of personnel, the restriction of areas, the completion of checklists, etc.

5.3.3 Personal Protective Equipment

Equipment Type	PPE
Jackhammers	Eye Protection, Anti-vibration Gloves, Foot Protection, Hard Hat and Hearing Protection
Soil Compactors	Hearing Protection, Eye Protection, Anti-vibration Gloves, Hard Hat and Foot Protection
Chipping Hammers	Eye Protection, Face Protection, Anti-Vibration Gloves, Foot Protection
Impact Wrenches	Hearing Protection and Eye Protection
Reamers	Eye Protection
Arc Welders	Hand Protection and Eye Protection, appropriately filtered, leather and or other protection covering exposed skin, clothing.
Explosive-Actuated Tools	Eye Protection, hearing protection, anti-vibration gloves, hard hat, sleeved shirt
Grinders	Eye Protection, Face Protection, hearing protection
Hand-Held Chipping Hammers	Eye Protection, Face Protection, hearing protection

5.3.3.1. The table below lists the minimum required PPE for some hand and power tools.

5.3.3.2. Administrative controls regarding the use of hand and power tools may be the posting of warning signage, the establishment of controlled access zones, rotation of personnel, the restriction of areas, the completion of checklists, etc.

5.4 Training

5.4.1. Workers must be trained on the proper use, maintenance, and inspection of tools.

6.0 References

FED / OSHA CFR 1926.300 – Tools – Hand and Power

CAL / OSHA T8 Article 27 Section 1684 – 1692 – Tool Design Requirements

L&I WAC 296-807 – Portable Power Tools

7.0 Attachments

Coring and Saw Cutting Checklist

Demolition Permit

Hazard Communication Program

This program has been developed and implemented to comply with the requirements of the Federal, State and Local standards; a written copy of this program is maintained at the workplace. The Hazard Communication Program informs the workforce of the safe use, handling and storage of hazardous chemicals which may be encountered while performing job assignments.

Policy Statement

All employees:

- Will be properly advised when working with or being exposed to hazardous chemical used in the workplace
- Will be informed of all known or suspected hazardous substances in the workplace be properly labeled, including secondary containers
- Will be properly trained in the safe handling of hazardous substances prior to an exposure of a hazardous chemical
- Will be issued the necessary, appropriate, protective equipment and devices who are working with or exposed to hazardous substances
- Emergency handling procedures will be established at local levels on a case-by-case basis, including the maintenance of necessary first-aid facilities in the event of an incident involving a hazardous substance.

Responsibilities

The individual Project Superintendent and/or Project Manager is/are delegated the responsibility of implementing the Hazard Communications Program at the work site.

The responsibilities include the following:

- To review and be familiar with the Federal and State OSHA/WISHA – Hazard Communication Requirement
- If warranted and necessary, designate subordinates responsible for implementing and monitoring the program
- Develop and maintain an inventory of all hazardous substances to which employees might be exposed
- Collect and maintain current Safety Data Sheets (SDS) for all hazardous substances at the workplace in both electronic and hard copies on the jobsite
- Review original and secondary containers to ensure that they are properly labeled
- Conduct employee training regarding hazardous substances to which employees may be exposed to and on the contents of the Hazard Communication Regulation
- Ensure that potentially exposed employees have access to and utilize proper protective equipment and devices and that emergency handling procedures and first aid facilities are in place in the event of an incident
- Maintain a plan for an on-going Hazard Communication Program which ensures that:
    - New employees are properly trained
    - New Hazardous substances are received with proper labeling and Safety Data Sheets
    - Current employees are retrained when new hazardous substances are introduced into the workplace.
- Make sure subcontractors comply with these requirements.

Summary of the Requirements

This program applies to all BNBuilders' employees, Trade Partners and their tiers. All hazardous substances found in the workplace under normal or reasonably foreseeable emergency conditions (i.e., spill or release of a chemical) are included.

BNBuilders will inform the employees of our Trade Partners (Subcontractors) their tiers, designated representative, and any Federal, State or Local regulatory agency of the hazardous substances in the workplace during the Project's New Hire Orientation process and continually while on the project. A copy of BNB's Hazard Communications Program to include the Safety Data Sheets (SDS) will be readily available for all workers and regulatory agencies. This information, to include the introduction of a new hazardous substance will be disseminated and discussed during the projects' Weekly Safety Meetings, Toolbox Talks and other means of communication.

Exclusions

The Hazard Communication Standard does exempt some chemicals from coverage. Chemicals exempted from labeling include:

- Pesticides (if covered by other federal regulations)
- Food, food additives, color additives, drugs, cosmetic or medical and veterinary supplies
- Distilled spirits or malt beverages for non-industrial use
- Consumer products (covered by other regulations)

Exemptions from the entire section pertaining to construction are:

- Hazardous wastes (subject to SPA regulations)
- Tobacco or tobacco products
- Wood or wood products (but not chemicals used to treat wood and treated lumber)
- Articles (manufactured items which do not release or otherwise result in exposure to a hazardous chemical under normal conditions of use)

Hazard Determination

OSHA/WISHA's definition of a Hazardous Chemical under the HCS is any chemical labeled as hazardous by a recognized authority such as OSHA/WISHA or the manufacturer, and any chemical that can create an effect on a person even if that effect is temporary. Under the current standard most chemicals, unless specifically exempted, should be treated as hazardous. Under the HCS there are no exposure limits set, so any amount of a chemical could trigger the standards requirements. Potential as well as actual exposure of a chemical to an employee must be considered when determining what chemicals should be treated as hazardous.

OSHA defines Hazardous Chemicals as:

- Any chemical listed in the toxic registry found to be carcinogenic by the International Agency for Research on Cancer (IARC).
- Listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens by the National Toxicology Program (NTP).
- Regulated by OSHA/WISHA as a carcinogen.
- Corrosive as defined by U.S. Department of Transportation in Appendix A 49 CFR, Part 173.
- Highly toxic (any chemical recognized as poisonous).
- Irritants – a chemical that causes a reversible inflammatory effect on living tissue.
- Sensitizer – a chemical that causes a substantial proportion of persons or animals to develop an allergic reaction.
- Any by-product produced that has any affects listed above.

Safety Data Sheets (SDS)

Employers should receive an SDS from the manufacturer upon the initial purchase of a hazardous substance. The SDS provides both the employer and the employee with information necessary for working safely with a specific chemical. When an SDS is needed, contact the manufacturer, distributor or supplier in writing. If an SDS is not available from a manufacturer, OSHA should be notified in writing.

All subcontractors are to submit their SDS's to BNBuilders prior to mobilization and/or when a new hazardous chemical is introduced to the project. BNB will maintain the SDS's in the Project Office. SDS's will be available for review by all affected Contractors and their employees.

The SDS should cover 16 major elements. However, OSHA/WISHA will not be enforcing information requirements in sections 12 through 15 as these are not under its jurisdiction. If there is no relevant or applicable information, it should be so stated on the SDS. The mandatory items for inclusion are:

Minimum information for an SDS:

1.	**Identification of the substance or mixture and of the supplier**	▪ GHS product identifier. ▪ Other means of identification. ▪ Recommended use of the chemical and restrictions on use. ▪ Supplier's details (including name, address, phone number, etc.). ▪ Emergency phone number.
2.	**Hazards identification**	▪ GHS classification of the substance/mixture and any national or regional information. ▪ GHS label elements, including precautionary statements. (Hazard symbols may be provided as a graphical reproduction of the symbols in black and white or the name of the symbol, e.g., flame, skull and crossbones.) ▪ Other hazards which do not result in classification (e.g., dust explosion hazard) or are not covered by the GHS.

3.	**Composition/information on ingredients**	**Substance** ▪ Chemical identity. ▪ Common name, synonyms, etc. ▪ CAS number, EC number, etc. ▪ Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance. **Mixture** ▪ The chemical identity and concentration or concentration ranges of all ingredients which are hazardous within the meaning of the GHS and are present above their cutoff levels. ***NOTE**: For information on ingredients, the competent authority rules for CBI take priority over the rules for product identification.*
4.	**First aid measures**	▪ Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion. ▪ Most important symptoms/effects, acute and delayed. ▪ Indication of immediate medical attention and special treatment needed, if necessary.
5.	**Firefighting measures**	▪ Suitable (and unsuitable) extinguishing media. ▪ Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products). ▪ Special protective equipment and precautions for firefighters.
6.	**Accidental release measures**	▪ Personal precautions, protective equipment and emergency procedures. ▪ Environmental precautions. ▪ Methods and materials for containment and cleaning up.
7.	**Handling and storage**	▪ Precautions for safe handling. ▪ Conditions for safe storage, including any incompatibilities.

8.	**Exposure controls/personal protection**.	▪ Control parameters, e.g., occupational exposure limit values or biological limit values. ▪ Appropriate engineering controls. ▪ Individual protection measures, such as personal protective equipment.
9.	**Physical and chemical properties**	▪ Appearance (physical state, color, etc.). ▪ Odor. ▪ Odor threshold. ▪ pH. ▪ melting point/freezing point. ▪ initial boiling point and boiling range. ▪ flash point. ▪ evaporation rate. ▪ flammability (solid, gas). ▪ upper/lower flammability or explosive limits. ▪ vapor pressure. ▪ vapor density. ▪ relative density. ▪ solubility(ies). ▪ partition coefficient: n-octanol/water. ▪ autoignition temperature. ▪ decomposition temperature.
10.	**Stability and reactivity**	▪ Chemical stability. ▪ Possibility of hazardous reactions. ▪ Conditions to avoid (e.g., static discharge, shock or vibration). ▪ Incompatible materials. ▪ Hazardous decomposition products.
11.	**Toxicological information**	Concise but complete and comprehensible description of the various toxicological (health) effects and the available data used to identify those effects, including: ▪ information on the likely routes of exposure (inhalation, ingestion, skin and eye contact); ▪ Symptoms related to the physical, chemical and toxicological characteristics; ▪ Delayed and immediate effects and also chronic effects from short- and long-term exposure; ▪ Numerical measures of toxicity (such as acute toxicity estimates).

12.	**Ecological information**	▪ Ecotoxicity (aquatic and terrestrial, where available). ▪ Persistence and degradability. ▪ Bioaccumulative potential. ▪ Mobility in soil. ▪ Other adverse effects.
13.	**Disposal considerations**	▪ Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.
14.	**Transport information**	▪ UN Number. ▪ UN Proper shipping name. ▪ Transport Hazard class(es). ▪ Packing group, if applicable. ▪ Marine pollutant (Yes/No). ▪ Special precautions which a user needs to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises.
15.	**Regulatory information**	▪ Safety, health and environmental regulations specific for the product in question.
16.	**Other information including information on preparation and revision of the SDS**	

Manufacturers are required to update the SDS within three months of learning that new hazard data is available which affects the SDS information.

Labels and Other Forms of Warning

When the employer receives containers of a hazardous substance, the supplier's original containers should have a label providing the following information:

- Identity of the hazardous substance(s)
- Hazard warning statements
- Name and address of the chemical manufacturer or importer
- As hazardous substances are transferred from the original containers to portable or stationary containers, the employer needs to ensure that these secondary containers are labeled with the identity and the hazard warning statement
- Alternative posting, signs or placards may be used in lieu of labels directly affixed on stationary process containers
- Piping systems and portable containers for immediate use are exempt from labeling under California and Washington's Hazard Communication Regulation.

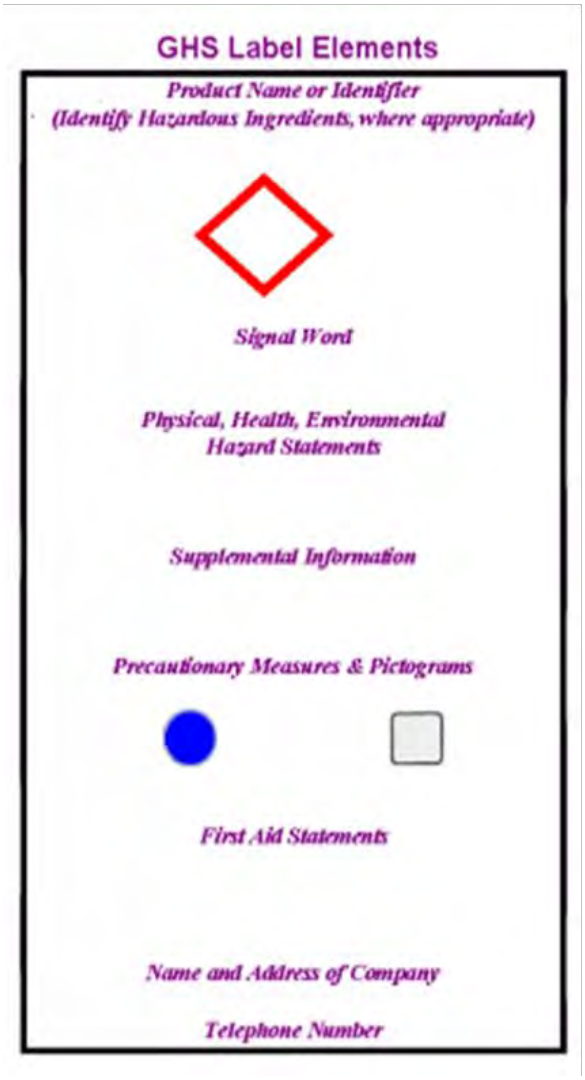
Globally Harmonized System (GHS)

Some GHS label elements have been standardized and are directly related to the endpoints and hazard level. The standardized label elements included in the GHS are:

- Symbols (hazard pictograms): Convey health, physical and environmental hazard information, assigned to a GHS hazard class and category.

- Signal Words: "Danger" or "Warning" is used to emphasize hazards and indicate the relative level of severity of the hazard, assigned to a GHS hazard class and category.
- Hazard Statements: Standard phrases assigned to a hazard class and category that describe the nature of the hazard.

The symbols, signal words, and hazard statements have all been standardized and assigned to specific hazard categories and classes, as appropriate. These standardized elements are not subject to variation and should appear on the GHS label as indicated in the GHS for each hazard category/class in the system.



Symbols/Pictograms

The GHS symbols have been incorporated into pictograms for use on the GHS label. Pictograms include the harmonized hazard symbols plus other graphic elements, such as borders, background patterns or colors which are intended to convey specific information.

Signal Words

The signal word indicates the relative degree of severity a hazard. The signal words used in the GHS are:

"Danger" for the more severe hazards, and
"Warning" for the less severe hazards.

Signal words are standardized and assigned to the hazard categories within endpoints. Some lower level hazard categories do not use signal words. Only one signal word corresponding to the class of the most severe hazard should be used on a label.

Hazard Statements
Hazard statements are standardized and assigned phrases that describe the hazard(s) as determined by hazard classification. An appropriate statement for each GHS hazard should be included on the label for products possessing more than one hazard.

Figure 4.9

GHS Pictograms and Hazard Classes		
		
▪ Oxidizers	▪ Flammables ▪ Self Reactives ▪ Pyrophorics ▪ Self-Heating ▪ Emits Flammable Gas ▪ Organic Peroxides	▪ Explosives ▪ Self Reactives ▪ Organic Peroxides

		
▪ Acute toxicity (severe)	▪ Corrosives	▪ Gases Under Pressure
		
▪ Carcinogen ▪ Respiratory Sensitizer ▪ Reproductive Toxicity ▪ Target Organ Toxicity ▪ Mutagenicity ▪ Aspiration Toxicity	▪ Environmental Toxicity	▪ Irritant ▪ Dermal Sensitizer ▪ Acute toxicity (harmful) ▪ Narcotic Effects ▪ Respiratory Tract ▪ Irritation

Figure 4.10

Transport "Pictograms"		
		
Flammable Liquid Flammable Gas Flammable Aerosol	**Flammable solid Self-Reactive Substances**	**Pyrophorics (Spontaneously Combustible) Self-Heating Substances**

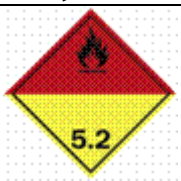
		
Substances, which in contact with water, emit flammable gases (Dangerous When Wet)	**Oxidizing Gases Oxidizing Liquids Oxidizing Solids**	**Explosive Divisions 1.1, 1.2, 1.3**
		
Explosive Division 1.4	**Explosive Division 1.5**	**Explosive Division 1.6**
		
Compressed Gases	**Acute Toxicity (Poison): Oral, Dermal, Inhalation**	**Corrosive**
		
Marine Pollutant	**Organic Peroxides**	

Figure 4.11

ACUTE ORAL TOXICITY - Annex 1

	Category 1	**Category 2**	**Category 3**	**Category 4**	**Category 5**
LD_{50}	£ 5 mg/kg	> 5 < 50 mg/kg	³ 50 < 300 mg/kg	³ 300 < 2000 mg/kg	³ 2000 < 5000 mg/kg
Pictogram					No symbol
Signal word	Danger	Danger	Danger	Warning	Warning
Hazard statement	Fatal if swallowed	Fatal if swallowed	Toxic if swallowed	Harmful if swallowed	May be harmful if swallowed

Other GHS label elements include:

- Precautionary Statements and Pictograms
  - Measures to minimize or prevent adverse effects.
- Product Identifier (ingredient disclosure)
  - Name or number used for a hazardous product on a label or in the SDS.
- Supplier identification
  - The name, address and telephone number should be provided on the label.
- Supplemental information
  - non-harmonized information.

Precautionary Statements and Pictograms

Precautionary information supplements the hazard information by briefly providing measures to be taken to minimize or prevent adverse effects from physical, health or environmental hazards. First aid is included in precautionary information. The GHS label should include appropriate precautionary information.

Product Identifier (Ingredient Disclosure)

A product identifier should be used on a GHS label and it should match the product identifier used on the SDS.

The GHS label for a substance should include the chemical identity of the substance (name as determined by IUPAC, ISO, CAS or technical name). For mixtures/alloys, the label should include the chemical identities of all ingredients that contribute to acute toxicity, skin corrosion or serious eye damage, germ cell mutagenicity, carcinogenicity, reproductive toxicity, skin or respiratory sensitization, or Target Organ Systemic Toxicity (TOST), when these hazards appear on the label. Where a product is supplied exclusively for workplace use, the Competent Authority may give suppliers discretion to include chemical identities on the SDS, in lieu of including them on labels. The Competent Authority rules for confidential business information (CBI) take priority over the rules for product identification.

Supplier Identification

The name, address and telephone number of the manufacturer or supplier of the product should be provided on the label.

Supplemental Information

Supplemental label information is non-harmonized information on the container of a hazardous product that is not required or specified under the GHS. In some cases, this information may be required by a Competent Authority or it may be additional information provided at the discretion of the manufacturer / distributor. The labeler should have the option of providing supplementary information related to the hazard, such as physical state or route of exposure, with the hazard statement.

How are multiple hazards handled on labels?

Where a substance or mixture presents more than one GHS hazard, there is a GHS precedence scheme for pictograms and signal words.

- For health hazards the following principles of precedence apply for symbols:
- If the skull and crossbones apply, the exclamation mark should not appear;
- If the corrosive symbol applies, the exclamation mark should not appear where it is used for skin or eye irritation;
- If the health hazard symbol appears for respiratory sensitization, the exclamation mark should not appear where it is used for skin sensitization or for skin or eye irritation.
- If the signal word 'Danger' applies, the signal word 'Warning' should not appear. All assigned hazard statements should appear on the label. The Competent Authority may choose to specify the order in which they appear.

Chemical Training

Many chemicals used in construction today are toxic. Some of the most common materials can be toxic after long or repeated exposure. Some also have a delayed effect, causing health problems which are not noticed right away. Contact the Safety Department to answer any questions on how to work safely with chemicals.

Chemicals affect us through our skin, eyes, lungs, or by getting on our food. It is everyone's responsibility to protect themself from these hazards by using proper clothing, gloves, goggles, respirators, good personal hygiene, and common sense.

Due to the infrequent use of chemicals on a construction site, all activities involving the use of chemicals shall be overseen by a Competent Person.

There are several kinds of chemical hazards:

Form Oils and Lubricants

Hazards: These can cause a skin condition called dermatitis. Some might contain additives that have more serious effects such as cancer.

Precautionary Measures: Protective gloves and clothing must be worn when using these materials. Respiratory protection is required when they are sprayed, heated, or burned.

Gasoline and Propane

Hazards: The primary danger with these chemicals is fire and explosion.

Precautionary Measures: The Superintendent should explain each of the following rules to each employee using or dispensing fuels.

- Never use fuels as solvents.
- Keep fuels only in approved, properly labeled containers which are in good condition.
- Store fuels away from any sources of ignition.
- Review the codes governing the storage of fuels.
- Provide adequate fire protection.
- Notify the local fire department of the location and amount of fuel stored on site.
- Post "No Smoking" signs.

Paints and Coatings

Hazards: Hazards vary, as there is a wide variety of paints and coatings with different levels of toxicity. If there are questions about the hazards of a product, ask the Safety Department for more information.

Paint or coating materials which may be toxic include the following:

- Oil based paints
- Epoxies and urethanes
- Varnishes and shellacs
- Concrete sealers and coatings
- Cold galvanizing
- Treatments for wood, plastic, or metal
- Coatings that are sprayed, troweled, brushed, or poured
- Floor coatings
- Primers and bonding agents

Precautionary Measures: Different kinds of protection are needed, depending on the product that will be used. Skin and eyes should be protected with gloves, clothing, and goggles wherever contact is possible; consult the MSDS for the PPE requirements. Ventilation shall be used if vapors can accumulate, personnel in respirators may also be used if ventilation is not sufficient. With products other than latex paints, airline respirators may also be needed.

Caulks, Mastics, and Glues

Hazards: Skin irritation and eye injury are the main hazards with these products. Some products can cause cancer with repeated skin contact. Toxic fumes can be a problem, especially in confined spaces. This is particularly true of petroleum and formaldehyde-based products and epoxy. Silicones are strong eye irritants. Cyanoacrylates (super glues) can bond skin on contact and cause immediate blindness upon eye contact.

Precautionary Measures: Gloves must always be used to prevent contact with the skin. Goggles must be worn if there is any chance of eye contact. Good personal hygiene is the best defense. Clean hands won't contaminate eyes, contact lenses, or food.

Solvents

Hazards: Solvents often produce toxic vapors that make respiratory protection necessary. Some are so toxic that special air-supplied respirators must be used. Most are harmful to the skin. Many are very flammable. The hazards associated with solvents are even greater when they are used in areas with poor ventilation, or in large quantities.

Precautionary Measures: Protective clothing and respirators are minimum precautions. The Safety Department should be consulted with any questions regarding proper handling.

Acids and Bases

Hazards: Hydrochloric acid, also called muriatic acid, can burn the skin and eyes, and create toxic fumes that can cause permanent lung damage. It is often used as a brick cleaner and for other jobs such as etching. Acids and bases can cause skin burns and must only be used with proper gloves, goggles, and respirators. These products include chlorine for tank cleaning, brick cleaners, and etching solutions.

Precautionary Measures: Use of proper gloves, goggles, body suits or chemical aprons and respirators.

Cement, Mortar, and Grout

Hazards: Even though these materials aren't toxic, prolonged exposure can cause lung damage and severe skin burns. Eye contact can cause blindness.

Precautionary Measures: Goggles should always be worn. Where dust will be produced, respirators should also be used. Employees whose job involves contact must wear rubber gloves and protective clothing. When skin is exposed, the material should be washed off immediately and then neutralized.

Sand Blasting, Dust, and Welding

Hazards: Sandblasting sand normally contains silica, as does much of the dust formed during general cleaning, concrete grinding and demolition work. Welding fumes from cutting or welding cad-plated galvanized or coated metals can be toxic. Use engineering controls like fans if possible.

Precautionary Measures: A respirator must be worn, and, in the case of sandblasting, only air-supplied hoods are allowed. Cutting and welding in confined spaces should be done only with the approval of the Superintendent. Oxygen deficiency, high fume concentrations, and explosion hazards can exist. Also review the possibility of Confined Space requirements.

Toxic Gas

Hazards: Hydrogen sulfide and carbon monoxide are the two most common gases that pose problems.

- Hydrogen sulfide is usually encountered when connecting into sanitary sewers, and in some industrial settings like paper mills and refineries. It is very dangerous, because it impairs the sense of smell at about the same rate at which it becomes highly toxic, so workers have no warning of their exposure.
- Carbon monoxide is most commonly found as exhaust from combustion such as heaters, cars, compressors, or other equipment. It can cause problems during heated concrete pours, and when working in confined spaces with mobile equipment, particularly during winter in enclosures.

Precautionary Measures: Ventilation is the best source of protection. Testing should be performed when the possibility of air contamination exists. Consult with the Safety Department for other issues to review.

STATE OF CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986

CHEMICALS KNOWN TO THE STATE TO CAUSE CANCER OR REPRODUCTIVE TOXICITY NOVEMBER 8, 2013

The Safe Drinking Water and Toxic Enforcement Act of 1986 requires that the Governor revise and republish at least once per year the list of chemicals known to the State to cause cancer or reproductive toxicity. The identification number indicated in the following list is the Chemical Abstracts Service (CAS) Registry Number. No CAS number is given when several substances are presented as a single listing. The date refers to the initial appearance of the chemical on the list. For easy reference, chemicals which are shown underlined are newly added. Chemicals or endpoints shown in strikeout were placed on the Proposition 65 list on the date noted and have subsequently been removed.

Chemical	Type of Toxicity	Listing Mechanism	CAS No.	Date Listed	NSRL or MADL (µg/day) [a]
A-alpha-C (2-Amino-9H-pyrido[2,3-b]indole)	cancer	AB	26148-68-5	1-Jan-90	2
Acetaldehyde	cancer	SQE	75-07-0	1-Apr-88	90 (inhalation)
Acetamide	cancer	AB	60-35-5	1-Jan-90	10
Acetazolamide	developmental	FR	59-66-5	20-Aug-99	
Acetochlor	cancer	SQE	34256-82-1	1-Jan-89	
Acetohydroxamic acid	developmental	FR	546-88-3	1-Apr-90	
2-Acetylaminofluorene	cancer	SQE	53-96-3	1-Jul-87	0.2
Acifluorfen sodium	cancer	AB	62476-59-9	1-Jan-90	
Acrylamide	cancer	AB	79-06-1	1-Jan-90	0.2

Acrylamide	developmental, male	AB	79-06-1	25-Feb-11	140
Acrylonitrile	cancer	FR	107-13-1	1-Jul-87	0.7
Actinomycin D	cancer	FR	50-76-0	1-Oct-89	0.00008
Actinomycin D	developmental	FR	50-76-0	1-Oct-92	
AF-2;[2-(2-furyl)-3-(5-nitro-2-furyl)]acrylamide	cancer	SQE	3688-53-7	1-Jul-87	3
Aflatoxins	cancer	SQE	---	1-Jan-88	
Alachlor	cancer	SQE	15972-60-8	1-Jan-89	
Alcoholic beverages, when associated with alcohol abuse	cancer	SQE	---	1-Jul-88	
Aldrin	cancer	SQE	309-00-2	1-Jul-88	0.04
All-trans retinoic acid	developmental	SQE	302-79-4	1-Jan-89	
Allyl chloride Delisted October 29, 1999 [Click here for the basis for delisting]	~~cancer~~	~~AB~~	~~107-05-1~~	~~1-Jan-90~~	
Alprazolam	developmental	FR	28981-97-7	1-Jul-90	
Altretamine	developmental, male	FR	645-05-6	20-Aug-99	
Amantadine hydrochloride	developmental	FR	665-66-7	27-Feb-01	
Amikacin sulfate	developmental	FR	39831-55-5	1-Jul-90	
2-Aminoanthraquinone	cancer	LC	117-79-3	1-Oct-89	20
p-Aminoazobenzene	cancer	AB	60-09-3	1-Jan-90	
o-Aminoazotoluene	cancer	SQE	97-56-3	1-Jul-87	0.2
4-Aminobiphenyl (4-aminodiphenyl)	cancer	LC	92-67-1	27-Feb-87	0.03
1-Amino-2,4-dibromoanthraquinone	cancer	AB	81-49-2	26-Aug-97	
3-Amino-9-ethylcarbazole hydrochloride	cancer	SQE	6109-97-3	1-Jul-89	9
2-Aminofluorene	cancer	SQE	153-78-6	29-Jan-99	

Aminoglutethimide	developmental	FR	125-84-8	1-Jul-90	
Aminoglycosides	developmental	FR	---	1-Oct-92	
1-Amino-2-methylanthraquinone	cancer	LC	82-28-0	1-Oct-89	5
2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazole	cancer	SQE	712-68-5	1-Jul-87	0.04
4-Amino-2-nitrophenol	cancer	SQE	119-34-6	29-Jan-99	
Aminopterin	developmental, female	SQE	54-62-6	1-Jul-87	
Amiodarone hydrochloride	developmental, female, male	FR	19774-82-4	26-Aug-97	
Amitraz	developmental	AB	33089-61-1	30-Mar-99	
Amitrole	cancer	SQE	61-82-5	1-Jul-87	0.7
Amoxapine	developmental	FR	14028-44-5	15-May-98	
Amsacrine	cancer	LC	51264-14-3	7-Aug-09	
tert-Amyl methyl ether	developmental	LC	994-05-8	18-Dec-09	
Anabolic steroids	female, male	FR	---	1-Apr-90	
Analgesic mixtures containing Phenacetin	cancer	LC	---	27-Feb-87	
Androstenedione	cancer	AB	63-05-8	3-May-11	
Angiotensin converting enzyme (ACE) inhibitors	developmental	FR	---	1-Oct-92	
Aniline	cancer	AB	62-53-3	1-Jan-90	100
Aniline hydrochloride	cancer	AB	142-04-1	15-May-98	
o-Anisidine	cancer	SQE	90-04-0	1-Jul-87	5
o-Anisidine hydrochloride	cancer	SQE	134-29-2	1-Jul-87	7
Anisindione	developmental	FR	117-37-3	1-Oct-92	
Anthraquinone	cancer	AB	84-65-1	28-Sep-07	
Antimony oxide (Antimony trioxide)	cancer	AB	1309-64-4	1-Oct-90	

Aramite	cancer	SQE	140-57-8	1-Jul-87	20
Areca nut	cancer	LC	---	3-Feb-06	
Aristolochic acids	cancer	LC	---	9-Jul-04	
Arsenic (inorganic arsenic compounds)	cancer	LC	--	27-Feb-87	0.06 (inhalation) 10 (except inhalation)
Arsenic (inorganic oxides)	developmental	SQE	---	1-May-97	
Asbestos	cancer	LC	1332-21-4	27-Feb-87	100 fibers/day (inhalation)
Aspirin (NOTE: It is especially important not to use aspirin during the last three months of pregnancy, unless specifically directed to do so by a physician because it may cause problems in the unborn child or complications during delivery.)	developmental, female	SQE	50-78-2	1-Jul-90	
Atenolol	developmental	FR	29122-68-7	26-Aug-97	
Auramine	cancer	SQE	492-80-8	1-Jul-87	0.8
Auranofin	developmental	FR	34031-32-8	29-Jan-99	

Avermectin B1 (Abamectin)	developmental	AB	71751-41-2	3-Dec-10	4.4
Azacitidine	cancer	AB	320-67-2	1-Jan-92	
Azaserine	cancer	SQE	115-02-6	1-Jul-87	0.06
Azathioprine	cancer	LC	446-86-6	27-Feb-87	0.4
Azathioprine	developmental	FR	446-86-6	1-Sep-96	
Azobenzene	cancer	AB	103-33-3	1-Jan-90	6
Barbiturates	developmental	FR	---	1-Oct-92	

Beclomethasone dipropionate	developmental	FR	5534-09-8	15-May-98	
Benomyl	developmental, male	SQE	17804-35-2	1-Jul-91	
Benthiavalicarb-isopropyl	cancer	AB	177406-68-7	1-Jul-08	
Benz[a]anthracene	cancer	SQE	56-55-3	1-Jul-87	0.033 (oral)
Benzene	cancer	LC	71-43-2	27-Feb-87	6.4 (oral) 13 (inhalation)
Benzene	developmental, male	SQE	71-43-2	26-Dec-97	24 (oral) 49 (inhalation)
Benzidine [and its salts]	cancer	LC	92-87-5	27-Feb-87	0.001
Benzidine-based dyes	cancer	FR	---	1-Oct-92	
Benzodiazepines	developmental	FR	---	1-Oct-92	
Benzo[b]fluoranthene	cancer	SQE	205-99-2	1-Jul-87	0.096 (oral)
Benzo[j]fluoranthene	cancer	SQE	205-82-3	1-Jul-87	0.11 (oral)
Benzo[k]fluoranthene	cancer	SQE	207-08-9	1-Jul-87	
Benzofuran	cancer	AB	271-89-6	1-Oct-90	1.1
Benzophenone	cancer	LC	119-61-9	22-Jun-12	-
Benzo[a]pyrene	cancer	SQE	50-32-8	1-Jul-87	0.06
Benzotrichloride	cancer	SQE	98-07-7	1-Jul-87	
Benzphetamine hydrochloride	developmental	FR	5411-22-3	1-Apr-90	
Benzyl chloride	cancer	AB	100-44-7	1-Jan-90	4
Benzyl violet 4B	cancer	SQE	1694-09-3	1-Jul-87	30
Beryllium and beryllium compounds	cancer	SQE	---	1-Oct-87	
Beryllium					0.1
Beryllium oxide					0.1
Beryllium sulfate					0.0002
Betel quid with tobacco	cancer	AB	---	1-Jan-90	

Betel quid without tobacco	cancer	LC	---	3-Feb-06	
2,2-Bis(bromomethyl)-1,3-propanediol	cancer	AB	3296-90-0	1-May-96	
Bis(2-chloroethyl)ether	cancer	SQE	111-44-4	1-Apr-88	0.3
N,N-Bis(2-chloroethyl)-2-naphthylamine (Chlornapazine)	cancer	LC	494-03-1	27-Feb-87	
Bischloroethyl nitrosourea (BCNU) (Carmustine)	cancer	SQE	154-93-8	1-Jul-87	
Bischloroethyl nitrosourea (BCNU) (Carmustine)	developmental	FR	154-93-8	1-Jul-90	
Bis(chloromethyl)ether	cancer	LC	542-88-1	27-Feb-87	0.02
Bis(2-chloro-1-methylethyl)ether, technical grade	cancer	SQE	---	29-Oct-99	
Bisphenol A (BPA) Delisted April 19, 2013 [Click here for the basis for delisting]	~~developmental~~	~~AB~~	~~80-05-7~~	~~11-Apr-13~~	
Bitumens, extracts of steam-refined and air refined	cancer	AB	---	1-Jan-90	
Bracken fern	cancer	AB	---	1-Jan-90	
Bromacil lithium salt	developmental	AB	53404-19-6	18-May-99	
Bromacil lithium salt	male	SQE	53404-19-6	17-Jan-03	
Bromate	cancer	AB	15541-45-4	31-May-02	
Bromochloroacetic acid	cancer	AB	5589-96-8	6-Apr-10	
Bromodichloromethane	cancer	AB	75-27-4	1-Jan-90	5
Bromoethane	cancer	AB	74-96-4	22-Dec-00	96
Bromoform	cancer	AB	75-25-2	1-Apr-91	64
1-Bromopropane (1-BP)	developmental, female, male	AB	106-94-5	7-Dec-04	
2-Bromopropane (2-BP)	female, male	AB	75-26-3	31-May-05	
Bromoxynil	developmental	FR	1689-84-5	1-Oct-90	

Bromoxynil octanoate	developmental	AB	1689-99-2	18-May-99	
Butabarbital sodium	developmental	FR	143-81-7	1-Oct-92	
1,3-Butadiene	cancer	SQE	106-99-0	1-Apr-88	0.4
1,3-Butadiene	developmental, female, male	AB	106-99-0	16-Apr-04	
1,4-Butanediol dimethanesulfonate (Busulfan)	cancer	LC	55-98-1	27-Feb-87	
1,4-Butanediol dimethanesulfonate (Busulfan)	developmental	SQE	55-98-1	1-Jan-89	
Butylated hydroxyanisole	cancer	AB	25013-16-5	1-Jan-90	4000
Butyl benzyl phthalate (BBP)[d]	developmental	AB	85-68-7	2-Dec-05	1200 (oral)
n-Butyl glycidyl ether	male	LC	2426-08-6	7-Aug-09	
beta-Butyrolactone	cancer	SQE	3068-88-0	1-Jul-87	0.7
Cacodylic acid	cancer	AB	75-60-5	1-May-96	
Cadmium	developmental, male	SQE	---	1-May-97	4.1 (oral)
Cadmium and cadmium compounds	cancer	SQE	---	1-Oct-87	
Cadmium					0.05 (inhalation)
Caffeic acid	cancer	AB	331-39-5	1-Oct-94	
Captafol	cancer	SQE	2425-06-1	1-Oct-88	5
Captan	cancer	AB	133-06-2	1-Jan-90	300
Carbamazepine	developmental	FR	298-46-4	29-Jan-99	
Carbaryl	cancer	AB	63-25-2	5-Feb-10	
Carbaryl	developmental, male	LC	63-25-2	7-Aug-09	
Carbazole	cancer	AB	86-74-8	1-May-96	4.1

Carbon black (airborne, unbound particles of respirable size)	cancer	AB	1333-86-4	21-Feb-03	
Carbon disulfide	developmental, female, male	SQE	75-15-0	1-Jul-89	
Carbon monoxide	developmental	SQE	630-08-0	1-Jul-89	
Carbon tetrachloride	cancer	SQE	56-23-5	1-Oct-87	5
Carbon-black extracts	cancer	AB	---	1-Jan-90	
Carboplatin	developmental	FR	41575-94-4	1-Jul-90	
N-Carboxymethyl-N-nitrosourea	cancer	SQE	60391-92-6	25-Jan-02	0.7
Catechol	cancer	AB	120-80-9	15-Jul-03	
Ceramic fibers (airborne particles of respirable size)	cancer	AB	---	1-Jul-90	
Certain combined chemotherapy for lymphomas	cancer	LC	---	27-Feb-87	
Chenodiol	developmental	FR	474-25-9	1-Apr-90	
Chloral	cancer	LC	75-87-6	13-Sep-13	
Chloral hydrate	cancer	LC	302-17-0	13-Sep-13	
Chlorambucil	cancer	LC	305-03-3	27-Feb-87	0.002
Chlorambucil	developmental	SQE	305-03-3	1-Jan-89	
Chloramphenicol Delisted January 4, 2013 [Click here for the basis for delisting]	~~cancer~~	~~LC~~	~~56-75-7~~	~~1-Oct-89~~	
Chloramphenicol sodium succinate	cancer	FR	982-57-0	27-Sep-13	
Chlorcyclizine hydrochloride	developmental	FR	1620-21-9	1-Jul-87	
Chlordane	cancer	SQE	57-74-9	1-Jul-88	0.5
Chlordecone (Kepone)	cancer	SQE	143-50-0	1-Jan-88	0.04
Chlordecone (Kepone)	developmental	SQE	143-50-0	1-Jan-89	
Chlordiazepoxide	developmental	FR	58-25-3	1-Jan-92	

Chlordiazepoxide hydrochloride	developmental	FR	438-41-5	1-Jan-92	
Chlordimeform	cancer	SQE	6164-98-3	1-Jan-89	
Chlorendic acid	cancer	SQE	115-28-6	1-Jul-89	8
Chlorinated paraffins (Average chain length, C12;approximately 60 percent chlorine by weight)	cancer	SQE	108171-26-2	1-Jul-89	8
p-Chloroaniline	cancer	AB	106-47-8	1-Oct-94	1.5
p-Chloroaniline hydrochloride	cancer	AB	20265-96-7	15-May-98	1.9
Chlorodibromomethane Delisted October 29, 1999 [Click here for the basis for delisting]	~~cancer~~	~~AB~~	~~124-48-1~~	~~1-Jan-90~~	
Chloroethane (Ethyl chloride)	cancer	AB	75-00-3	1-Jul-90	150
1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea (CCNU) (Lomustine)	cancer	SQE	13010-47-4	1-Jan-88	
1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea (CCNU) (Lomustine)	developmental	FR	13010-47-4	1-Jul-90	
1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea (Methyl-CCNU)	cancer	SQE	13909-09-6	1-Oct-88	
Chloroform	cancer	SQE	67-66-3	1-Oct-87	20 (oral) 40 (inhalation)
Chloroform	developmental	LC	67-66-3	7-Aug-09	
Chloromethyl methyl ether (technical grade)	cancer	LC	107-30-2	27-Feb-87	0.3
3-Chloro-2-methylpropene	cancer	SQE	563-47-3	1-Jul-89	5
1-Chloro-4-nitrobenzene	cancer	SQE	100-00-5	29-Oct-99	
4-Chloro-*o*-phenylenediamine	cancer	SQE	95-83-0	1-Jan-88	40
Chloroprene	cancer	AB	126-99-8	2-Jun-00	
2-Chloropropionic acid	male	LC	598-78-7	7-Aug-09	
Chlorothalonil	cancer	SQE	1897-45-6	1-Jan-89	41
p-Chloro-*o*-toluidine	cancer	AB	95-69-2	1-Jan-90	3

p-Chloro-*o*-toluidine, strong acid salts of	cancer	AB	---	15-May-98	
p-Chloro-*o*-toluidine, hydrochloride					3.3
5-Chloro-*o*-toluidine and its strong acid salts	cancer	SQE	---	24-Oct-97	
Chlorotrianisene	cancer	FR	569-57-3	1-Sep-96	
Chlorozotocin	cancer	AB	54749-90-5	1-Jan-92	0.003
Chlorsulfuron [Click here for the basis for removal of male reproductive toxicity endpoint]	developmental, female, ~~male~~	AB	64902-72-3	14-May-99	
Chromium (hexavalent compounds)	cancer	LC	---	27-Feb-87	0.001 (inhalation)
Chromium (hexavalent compounds)	developmental, female, male	SQE	---	19-Dec-08	8.2 (oral)
Chrysene	cancer	AB	218-01-9	1-Jan-90	0.35 (oral)
C.I. Acid Red 114	cancer	AB	6459-94-5	1-Jul-92	
C.I. Basic Red 9 monohydrochloride	cancer	SQE	569-61-9	1-Jul-89	3
C.I. Direct Blue 15	cancer	AB	2429-74-5	26-Aug-97	
C.I. Direct Blue 218	cancer	AB	28407-37-6	26-Aug-97	50
C.I. Disperse Yellow 3	cancer	SQE	2832-40-8	8-Feb-13	
C.I. Solvent Yellow 14	cancer	AB	842-07-9	15-May-98	
Ciclosporin (Cyclosporin A; Cyclosporine)	cancer	AB	59865-13-3; 79217-60-0	1-Jan-92	
Cidofovir	cancer, developmental, female, male	FR	113852-37-2	29-Jan-99	
Cinnamyl anthranilate	cancer	SQE	87-29-6	1-Jul-89	200
Cisplatin	cancer	SQE	15663-27-1	1-Oct-88	
Citrus Red No. 2	cancer	LC	6358-53-8	1-Oct-89	
Cladribine	developmental	FR	4291-63-8	1-Sep-96	

Clarithromycin	developmental	FR	81103-11-9	1-May-97	
Clobetasol propionate	developmental, female	FR	25122-46-7	15-May-98	
Clofibrate	cancer	FR	637-07-0	1-Sep-96	
Clomiphene citrate	cancer	FR	50-41-9	24-May-13	
Clomiphene citrate	developmental	FR	50-41-9	1-Apr-90	
Clorazepate dipotassium	developmental	FR	57109-90-7	1-Oct-92	
Cobalt metal powder	cancer	AB	7440-48-4	1-Jul-92	
Cobalt [II] oxide	cancer	AB	1307-96-6	1-Jul-92	
Cobalt sulfate	cancer	LC	10124-43-3	20-May-05	
Cobalt sulfate heptahydrate	cancer	AB	10026-24-1	2-Jun-00	
Cocaine	developmental, female	SQE	50-36-2	1-Jul-89	
Coconut oil diethanolamine condensate (cocamide diethanolamine)	cancer	LC	68603-42-9	22-Jun-12	
Codeine phosphate	developmental	FR	52-28-8	15-May-98	
Coke oven emissions	cancer	LC	---	27-Feb-87	0.3
Colchicine	developmental, male	FR	64-86-8	1-Oct-92	
Conjugated estrogens	cancer	LC	---	27-Feb-87	

Conjugated estrogens	developmental	FR	---	1-Apr-90	
Creosotes	cancer	SQE	---	1-Oct-88	
p-Cresidine	cancer	SQE	120-71-8	1-Jan-88	5
Cumene	cancer	AB	98-82-8	6-Apr-10	
Cupferron	cancer	SQE	135-20-6	1-Jan-88	3

Cyanazine	developmental	FR	21725-46-2	1-Apr-90	
Cycasin	cancer	SQE	14901-08-7	1-Jan-88	
Cycloate	developmental	AB	1134-23-2	19-Mar-99	
Cyclohexanol Delisted January 25, 2002 [Click here for the basis for delisting]	~~male~~	~~AB~~	~~108-93-0~~	~~6-Nov-98~~	
Cycloheximide	developmental	FR	66-81-9	1-Jan-89	
Cyclopenta[*cd*]pyrene	cancer	LC	27208-37-3	29-Apr-11	.
Cyclophosphamide (anhydrous)	cancer	LC	50-18-0	27-Feb-87	1
Cyclophosphamide (anhydrous)	developmental, female, male	SQE - developmental FR - female, male	50-18-0	1-Jan-89	.
Cyclophosphamide (hydrated)	cancer	LC	6055-19-2	27-Feb-87	1
Cyclophosphamide (hydrated)	developmental, female, male	SQE - developmental FR - female, male	6055-19-2	1-Jan-89	
Cyhexatin	developmental	FR	13121-70-5	1-Jan-89	
Cytarabine	developmental	SQE	147-94-4	1-Jan-89	
Cytembena	cancer	AB	21739-91-3	15-May-98	
D&C Orange No. 17	cancer	AB	3468-63-1	1-Jul-90	
D&C Red No. 8	cancer	AB	2092-56-0	1-Oct-90	
D&C Red No. 9	cancer	AB	5160-02-1	1-Jul-90	100
D&C Red No. 19	cancer	AB	81-88-9	1-Jul-90	
Dacarbazine	cancer	SQE	4342-03-4	1-Jan-88	0.01
Dacarbazine	developmental	FR	4342-03-4	29-Jan-99	

Daminozide	cancer	AB	1596-84-5	1-Jan-90	40

Danazol	developmental	FR	17230-88-5	1-Apr-90	
Dantron (Chrysazin; 1,8-Dihydroxyanthraquinone)	cancer	AB	117-10-2	1-Jan-92	9
Daunomycin	cancer	SQE	20830-81-3	1-Jan-88	
Daunorubicin hydrochloride	developmental	FR	23541-50-6	1-Jul-90	
2,4-D butyric acid [Click here for the basis for the removal of developmental toxicity endpoint]	~~developmental~~, male	AB	94-82-6	18-Jun-99	910
DDD (Dichlorodiphenyl-dichloroethane)	cancer	SQE	72-54-8	1-Jan-89	2 (DDT, DDE, DDD in combination)
DDE (Dichlorodiphenyl-dichloroethylene)	cancer	SQE	72-55-9	1-Jan-89	2 (DDT, DDE, DDD in combination)
DDT (Dichlorodiphenyl-trichloroethane)	cancer	SQE	50-29-3	1-Oct-87	2 (DDT, DDE, DDD in combination)
o,p'-DDT	developmental, female, male	AB	789-02-6	15-May-98	
p,p'-DDT	developmental, female, male	AB	50-29-3	15-May-98	
DDVP (Dichlorvos)	cancer	SQE	62-73-7	1-Jan-89	2
2,4-DP (dichloroprop) Delisted January 25, 2002 [Click here for the basis for delisting]	~~developmental~~	~~AB~~	~~120-36-5~~	~~27-Apr-99~~	
Demeclocycline hydrochloride (internal use)	developmental	FR	64-73-3	1-Jan-92	
N,N'-Diacetylbenzidine	cancer	LC	613-35-4	1-Oct-89	
2,4-Diaminoanisole	cancer	FR	615-05-4	1-Oct-90	30
2,4-Diaminoanisole sulfate	cancer	SQE	39156-41-7	1-Jan-88	50

4,4'-Diaminodiphenyl ether (4,4'-Oxydianiline)	cancer	SQE	101-80-4	1-Jan-88	5
2,4-Diaminotoluene	cancer	SQE	95-80-7	1-Jan-88	0.2
Diaminotoluene (mixed)	cancer	AB	---	1-Jan-90	
Diazepam	developmental	FR	439-14-5	1-Jan-92	
Diazoaminobenzene	cancer	LC	136-35-6	20-May-05	
Diazoxide	developmental	FR	364-98-7	27-Feb-01	
Dibenz[a,h]acridine	cancer	SQE	226-36-8	1-Jan-88	
Dibenz[a,j]acridine	cancer	SQE	224-42-0	1-Jan-88	
Dibenz[a,h]anthracene	cancer	SQE	53-70-3	1-Jan-88	0.2
7H-Dibenzo[c,g]carbazole	cancer	SQE	194-59-2	1-Jan-88	0.0030 (oral)
Dibenzo[a,e]pyrene	cancer	SQE	192-65-4	1-Jan-88	
Dibenzo[a,h]pyrene	cancer	SQE	189-64-0	1-Jan-88	0.0054 (oral)
Dibenzo[a,i]pyrene	cancer	SQE	189-55-9	1-Jan-88	0.0050 (oral)
Dibenzo[a,l]pyrene	cancer	SQE	191-30-0	1-Jan-88	
Dibromoacetic acid	cancer	AB	631-64-1	17-Jun-08	
Dibromoacetonitrile	cancer	AB	3252-43-5	3-May-11	-
1,2-Dibromo-3-chloropropane (DBCP)	cancer	FR	96-12-8	1-Jul-87	0.1
1,2-Dibromo-3-chloropropane (DBCP)	male	LC	96-12-8	27-Feb-87	3.1 (oral) 4.3 (inhalation)
2,3-Dibromo-1-propanol	cancer	AB	96-13-9	1-Oct-94	
Dichloroacetic acid	cancer	AB	79-43-6	1-May-96	
Dichloroacetic acid	developmental, male	AB	79-43-6	7-Aug-09	
p-Dichlorobenzene	cancer	SQE	106-46-7	1-Jan-89	20
3,3'-Dichlorobenzidine	cancer	SQE	91-94-1	1-Oct-87	0.6
3,3'-Dichlorobenzidine dihydrochloride	cancer	AB	612-83-9	15-May-98	

1,1-Dichloro-2,2-bis(*p*-chlorophenyl)ethylene (DDE)	developmental, male	AB	72-55-9	30-Mar-10	
1,4-Dichloro-2-butene	cancer	AB	764-41-0	1-Jan-90	
3,3'-Dichloro-4,4'-diamino-diphenyl ether	cancer	SQE	28434-86-8	1-Jan-88	
1,1-Dichloroethane	cancer	AB	75-34-3	1-Jan-90	100
Dichloromethane (Methylene chloride)	cancer	SQE	75-09-2	1-Apr-88	50 200 (inhalation)
Dichlorophene	developmental	AB	97-23-4	27-Apr-99	
Dichlorphenamide	developmental	FR	120-97-8	27-Feb-01	
Diclofop-methyl	cancer	AB	51338-27-3	6-Apr-10	
Diclofop methyl	developmental	AB	51338-27-3	5-Mar-99	
1,2-Dichloropropane	cancer	AB	78-87-5	1-Jan-90	9.7
1,3-Dichloro-2-propanol (1,3-DCP)	cancer	SQE	96-23-1	8-Oct-10	
1,3-Dichloropropene	cancer	SQE	542-75-6	1-Jan-89	
Dicumarol	developmental	FR	66-76-2	1-Oct-92	
Dieldrin	cancer	SQE	60-57-1	1-Jul-88	0.04
Dienestrol Delisted January 4, 2013 [Click here for the basis for delisting]	~~cancer~~	~~LC~~	~~84-17-3~~	~~1-Jan-90~~	
Diepoxybutane	cancer	SQE	1464-53-5	1-Jan-88	
Diesel engine exhaust	cancer	AB	---	1-Oct-90	
Diethanolamine	cancer	LC	111-42-2	22-Jun-12	
Di(2-ethylhexyl)phthalate	cancer	SQE	117-81-7	1-Jan-88	310
Di(2-ethylhexyl)phthalate	developmental, male	AB	117-81-7	24-Oct-03	
Adult[b]		-			4200 (intravenous)
Infant boys, age 29 days to 24 months[b]		-			600 (intravenous)

Neonatal infant boys, age 0 to 28 days[b]		-			210 (intravenous)
Adult[b]		-			410 (oral)
Infant boys, age 29 days to 24 months[b]		-			58 (oral)
Neonatal infant boys, age 0 to 28 days[b]		-			20 (oral)
1,2-Diethylhydrazine	cancer	SQE	1615-80-1	1-Jan-88	
Diethylstilbestrol (DES)	cancer	LC	56-53-1	27-Feb-87	0.002
Diethylstilbestrol (DES)	developmental	FR	56-53-1	1-Jul-87	
Diethyl sulfate	cancer	SQE	64-67-5	1-Jan-88	
Diflunisal	developmental, female	FR	22494-42-4	29-Jan-99	
Diglycidyl ether	male	LC	2238-07-5	7-Aug-09	
Diglycidyl resorcinol ether (DGRE)	cancer	SQE	101-90-6	1-Jul-89	0.4
Dihydroergotamine mesylate	developmental	FR	6190-39-2	1-May-97	
Dihydrosafrole	cancer	SQE	94-58-6	1-Jan-88	20
Diisopropyl sulfate	cancer	AB	2973-10-6	1-Apr-93	
Di-isodecyl phthalate (DIDP)	developmental	AB	68515-49-1/ 26761-40-0	20-Apr-07	2200
Diltiazem hydrochloride	developmental	FR	33286-22-5	27-Feb-01	
3,3'-Dimethoxybenzidine (*o*-Dianisidine)	cancer	SQE	119-90-4	1-Jan-88	0.15
3,3'-Dimethoxybenzidine dihydrochloride	cancer	AB	20325-40-0	1-Oct-90	0.19
3,3'-Dimethoxybenzidine-based dyes metabolized to 3,3'-dimethoxybenzidine	cancer	AB	---	11-Jun-04	
N,N-Dimethylacetamide	developmental	LC	127-19-5	21-May-10	
4-Dimethylaminoazobenzene	cancer	SQE	60-11-7	1-Jan-88	0.2

trans-2-[(Dimethylamino)methylimino]-5-[2-(5-nitro-2-furyl)vinyl]-1,3,4-oxadiazole	cancer	SQE	55738-54-0	1-Jan-88	2
7,12-Dimethylbenz(a)anthracene	cancer	AB	57-97-6	1-Jan-90	0.003
3,3'-Dimethylbenzidine (ortho-Tolidine)	cancer	SQE	119-93-7	1-Jan-88	0.044
3,3'-Dimethylbenzidine dihydrochloride	cancer	AB	612-82-8	1-Apr-92	0.059
3,3'-Dimethylbenzidine-based dyes metabolized to 3,3'-dimethylbenzidine	cancer	AB	---	11-Jun-04	
Dimethylcarbamoyl chloride	cancer	SQE	79-44-7	1-Jan-88	0.05
1,1-Dimethylhydrazine (UDMH)	cancer	LC	57-14-7	1-Oct-89	
1,2-Dimethylhydrazine	cancer	SQE	540-73-8	1-Jan-88	0.001
2,6-Dimethyl-N-nitrosomorpholine (DMNM)	cancer	SQE	1456-28-6	8-Feb-13	.
Dimethyl sulfate	cancer	SQE	77-78-1	1-Jan-88	
Dimethylvinylchloride	cancer	SQE	513-37-1	1-Jul-89	20
Di-*n*-butyl phthalate (DBP)	developmental, female, male	AB	84-74-2	2-Dec-05	8.7
Di-*n*-hexyl phthalate (DnHP)	female, male	AB	84-75-3	2-Dec-05	2200 (oral)
m-Dinitrobenzene	male	AB	99-65-0	1-Jul-90	38
o-Dinitrobenzene	male	AB	528-29-0	1-Jul-90	
p-Dinitrobenzene	male	AB	100-25-4	1-Jul-90	
3,7-Dinitrofluoranthene	cancer	AB	105735-71-5	26-Aug-97	
3,9-Dinitrofluoranthene	cancer	AB	22506-53-2	26-Aug-97	
1,3-Dinitropyrene	cancer	LC	75321-20-9	2-Nov-12	.
1,6-Dinitropyrene	cancer	AB	42397-64-8	1-Oct-90	
1,8-Dinitropyrene	cancer	AB	42397-65-9	1-Oct-90	
2,4-Dinitrotoluene	cancer	SQE	121-14-2	1-Jul-88	2
2,4-Dinitrotoluene	male	AB	121-14-2	20-Aug-99	

2,6-Dinitrotoluene	cancer	SQE	606-20-2	1-Jul-95	
2,6-Dinitrotoluene	male	AB	606-20-2	20-Aug-99	
Dinitrotoluene (technical grade)	female, male	AB	---	20-Aug-99	
Dinitrotoluene mixture, 2,4-/2,6-	cancer	AB	---	1-May-96	
Dinocap	developmental	FR	39300-45-3	1-Apr-90	
Dinoseb	developmental, male	FR	88-85-7	1-Jan-89	
Di-*n*-propyl isocinchomeronate (MGK Repellent 326)	cancer	AB	136-45-8	1-May-96	
1,4-Dioxane	cancer	SQE	123-91-1	1-Jan-88	30
Diphenylhydantoin (Phenytoin)	cancer	SQE	57-41-0	1-Jan-88	
Diphenylhydantoin (Phenytoin)	developmental	SQE	57-41-0	1-Jul-87	
Diphenylhydantoin (Phenytoin), sodium salt	cancer	SQE	630-93-3	1-Jan-88	
Direct Black 38 (technical grade)	cancer	SQE	1937-37-7	1-Jan-88	0.09
Direct Blue 6 (technical grade)	cancer	SQE	2602-46-2	1-Jan-88	0.09
Direct Brown 95 (technical grade)	cancer	SQE	16071-86-6	1-Oct-88	0.1
Disodium cyanodithioimidocarbonate	developmental	AB	138-93-2	30-Mar-99	56 (oral) 170 (oral) as 32% pesticidal formulation
Disperse Blue 1	cancer	AB	2475-45-8	1-Oct-90	200
Diuron	cancer	AB	330-54-1	31-May-02	
Doxorubicin hydrochloride (Adriamycin)	cancer	SQE	25316-40-9	1-Jul-87	
Doxorubicin hydrochloride (Adriamycin)	developmental, male	FR	25316-40-9	29-Jan-99	
Doxycycline (internal use)	developmental	FR	564-25-0	1-Jul-90	
Doxycycline calcium (internal use)	developmental	FR	94088-85-4	1-Jan-92	

Doxycycline hyclate (internal use)	developmental	FR	24390-14-5	1-Oct-91	
Doxycycline monohydrate (internal use)	developmental	FR	17086-28-1	1-Oct-91	
Emissions from combustion of coal	cancer	AB	---	7-Aug-13	
Endrin	developmental	AB	72-20-8	15-May-98	
Environmental tobacco smoke (ETS)	developmental	SQE	---	9-Jun-06	
Epichlorohydrin	cancer	SQE	106-89-8	1-Oct-87	9
Epichlorohydrin	male	AB	106-89-8	1-Sep-96	
Epoxiconazole	cancer	AB	135319-73-2	15-Apr-11	
Ergotamine tartrate	developmental	FR	379-79-3	1-Apr-90	
Erionite	cancer	SQE	12510-42-8; 66733-21-9	1-Oct-88	
Estradiol 17B	cancer	SQE	50-28-2	1-Jan-88	0.02
Estragole	cancer	SQE	140-67-0	29-Oct-99	
Estrogens, steroidal	cancer	LC	---	19-Aug-05	
Estrogen-progestogen (combined) used as menopausal therapy	cancer	LC	---	4-Nov-11	
Estrone	cancer	SQE	53-16-7	1-Jan-88	
Estropipate	cancer, developmental	FR	7280-37-7	26-Aug-97	
Ethanol in alcoholic beverages	cancer	LC	---	29-Apr-11	
Ethinylestradiol	cancer	SQE	57-63-6	1-Jan-88	
Ethionamide	developmental	FR	536-33-4	26-Aug-97	
Ethoprop	cancer	AB	13194-48-4	27-Feb-01	
Ethyl acrylate	cancer	SQE	140-88-5	1-Jul-89	
Ethyl alcohol in alcoholic beverages	developmental	SQE	---	1-Oct-87	

Ethylbenzene	cancer	AB	100-41-4	11-Jun-04	54 (inhalation) 41 (oral)
Ethyl-tert-butyl ether	male	LC	637-92-3	18-Dec-09	
Ethyl dipropylthiocarbamate	developmental	AB	759-94-4	27-Apr-99	700 (oral and inhalation) 6700 (dermal)
Ethyl-4,4'-dichlorobenzilate	cancer	AB	510-15-6	1-Jan-90	7
Ethylene dibromide	cancer	FR	106-93-4	1-Jul-87	0.2 (oral) 3 (inhalation)
Ethylene dibromide	developmental, male	AB	106-93-4	15-May-98	
Ethylene dichloride (1,2-Dichloroethane)	cancer	SQE	107-06-2	1-Oct-87	10
Ethylene glycol monoethyl ether	developmental, male	SQE	110-80-5	1-Jan-89	750 (oral) 960 (inhalation)
Ethylene glycol monoethyl ether acetate	developmental, male	AB	111-15-9	1-Jan-93	1100 (oral) 1400 (inhalation)
Ethylene glycol monomethyl ether	developmental, male	SQE	109-86-4	1-Jan-89	63 (oral)
Ethylene glycol monomethyl ether acetate	developmental, male	AB	110-49-6	1-Jan-93	98 (oral)
Ethyleneimine	cancer	SQE	151-56-4	1-Jan-88	0.01
Ethylene oxide	cancer	FR	75-21-8	1-Jul-87	2
Ethylene oxide	female	LC	75-21-8	27-Feb-87	20
Ethylene oxide	developmental, male	LC	75-21-8	7-Aug-09	
Ethylene thiourea	cancer	AB	96-45-7	1-Jan-88	20
Ethylene thiourea	developmental	SQE	96-45-7	1-Jan-93	
2-Ethylhexanoic acid	developmental	LC	149-57-5	7-Aug-09	
Ethyl methanesulfonate	cancer	SQE	62-50-0	1-Jan-88	

Etodolac	developmental, female	FR	41340-25-4	20-Aug-99	
Etoposide	cancer	LC	33419-42-0	4-Nov-11	
Etoposide	developmental	FR	33419-42-0	1-Jul-90	
Etoposide in combination with cisplatin and bleomycin	cancer	LC	---	4-Nov-11	
Etretinate	developmental	SQE	54350-48-0	1-Jul-87	
Fenoxaprop ethyl	developmental	AB	66441-23-4	26-Mar-99	
Fenoxycarb	cancer	AB	72490-01-8	2-Jun-00	
Filgrastim	developmental	FR	121181-53-1	27-Feb-01	
Fluazifop butyl	developmental	AB	69806-50-4	6-Nov-98	
Flunisolide	developmental, female	FR	3385-03-3	15-May-98	
Fluorouracil	developmental	SQE	51-21-8	1-Jan-89	
Fluoxymesterone	developmental	FR	76-43-7	1-Apr-90	
Flurazepam hydrochloride	developmental	FR	1172-18-5	1-Oct-92	
Flurbiprofen	developmental, female	FR	5104-49-4	20-Aug-99	
Flutamide	developmental	FR	13311-84-7	1-Jul-90	
Fluticasone propionate	developmental	FR	80474-14-2	15-May-98	
Fluvalinate	developmental	AB	69409-94-5	6-Nov-98	
Folpet	cancer	SQE	133-07-3	1-Jan-89	200
Formaldehyde (gas)	cancer	SQE	50-00-0	1-Jan-88	40
2-(2-Formylhydrazino)-4-(5-nitro-2-furyl)thiazole	cancer	SQE	3570-75-0	1-Jan-88	0.3
Fumonisin B_1	cancer	AB	116355-83-0	14-Nov-03	

Furan	cancer	AB	110-00-9	1-Oct-93	
Furazolidone	cancer	AB	67-45-8	1-Jan-90	
Furmecyclox	cancer	AB	60568-05-0	1-Jan-90	20
Fusarin C	cancer	SQE	79748-81-5	1-Jul-95	
Gallium arsenide	cancer	LC	1303-00-0	1-Aug-08	
Ganciclovir	cancer, developmental, male	FR	82410-32-0	26-Aug-97	
Ganciclovir sodium	developmental, male	FR	107910-75-8	26-Aug-97	
Gasoline engine exhaust (condensates/extracts)	cancer	AB	---	1-Oct-90	
Gemfibrozil	cancer	FR	25812-30-0	22-Dec-00	
Gemfibrozil	female, male	FR	25812-30-0	20-Aug-99	
Glass wool fibers (inhalable and biopersistent)	cancer	AB	---	1-Jul-90	
Glu-P-1 (2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole)	cancer	AB	67730-11-4	1-Jan-90	0.1
Glu-P-2 (2-Aminodipyrido[1,2-a:3',2'-d]imidazole)	cancer	AB	67730-10-3	1-Jan-90	0.5
Glycidaldehyde	cancer	SQE	765-34-4	1-Jan-88	
Glycidol	cancer	AB	556-52-5	1-Jul-90	0.54
Goserelin acetate	developmental, female, male	FR	65807-02-5	26-Aug-97	
Griseofulvin	cancer	AB	126-07-8	1-Jan-90	
Gyromitrin (Acetaldehyde methylformylhydrazone)	cancer	SQE	16568-02-8	1-Jan-88	0.07
Halazepam	developmental	FR	23092-17-3	1-Jul-90	

Halobetasol propionate	developmental	FR	66852-54-8	20-Aug-99	
Haloperidol	developmental, female	FR	52-86-8	29-Jan-99	
Halothane	developmental	FR	151-67-7	1-Sep-96	
HC Blue 1	cancer	SQE	2784-94-3	1-Jul-89	10
Heptachlor	cancer	SQE	76-44-8	1-Jul-88	0.2
Heptachlor	developmental	AB	76-44-8	20-Aug-99	
Heptachlor epoxide	cancer	SQE	1024-57-3	1-Jul-88	0.08
Herbal remedies containing plant species of the genus Aristolochia	cancer	LC	---	9-Jul-04	
Hexachlorobenzene	cancer	SQE	118-74-1	1-Oct-87	0.4
Hexachlorobenzene	developmental	SQE	118-74-1	1-Jan-89	
Hexachlorobutadiene	cancer	AB	87-68-3	3-May-11	.
Hexachlorocyclohexane (technical grade)	cancer	SQE	---	1-Oct-87	0.2
Hexachlorocyclohexane (alpha isomer)					0.3
Hexachlorocyclohexane (beta isomer)					0.5
Hexachlorocyclohexane (gamma isomer)					0.6
Hexachlorodibenzodioxin	cancer	SQE	34465-46- 8	1-Apr-88	0.0002
Hexachloroethane	cancer	AB	67-72-1	1-Jul-90	20
2,4-Hexadienal (89% trans, trans isomer; 11% cis, trans isomer)	cancer	AB	---	4-Mar-05	
Hexafluoroacetone	male	LC	684-16-2	1-Aug-08	
Hexamethylphosphoramide	cancer	SQE	680-31-9	1-Jan-88	
Hexamethylphosphoramide	male	AB	680-31-9	1-Oct-94	
Histrelin acetate	developmental	FR	---	15-May-98	

Hydramethylnon	developmental, male	AB	67485-29-4	5-Mar-99	120 (oral)
Hydrazine	cancer	SQE	302-01-2	1-Jan-88	0.04
Hydrazine sulfate	cancer	SQE	10034-93-2	1-Jan-88	0.2
Hydrazobenzene (1,2-Diphenylhydrazine)	cancer	SQE	122-66-7	1-Jan-88	0.8
Hydrogen cyanide (HCN) and cyanide salts (CN salts)	male	AB	---	5-Jul-13	
Cyanide salts that readily dissociate in solution (expressed as cyanide)[f]					9.8
Hydrogen cyanide[f]					10 (oral)
Sodium cyanide[f]					19 (oral)
Potassium cyanide[f]					25 (oral)
1-Hydroxyanthraquinone	cancer	LC	129-43-1	27-May-05	
Hydroxyurea	developmental	FR	127-07-1	1-May-97	
Idarubicin hydrochloride	developmental, male	FR	57852-57-0	20-Aug-99	
Ifosfamide	developmental	FR	3778-73-2	1-Jul-90	
Iodine-131	developmental	SQE	10043-66-0	1-Jan-89	
Imazalil	cancer	AB	35554-44-0	20-May-11	11
Indeno [1,2,3-cd]pyrene	cancer	SQE	193-39-5	1-Jan-88	
Indium phosphide	cancer	AB	22398-80-7	27-Feb-01	
IQ (2-Amino-3-methylimidazo[4,5-f] quinoline)	cancer	AB	76180-96-6	1-Apr-90	0.5
Iprodione	cancer	AB	36734-19-7	1-May-96	
Iprovalicarb	cancer	AB	140923-17-7/ 140923-25-7	1-Jun-07	
Iron dextran complex	cancer	SQE	9004-66-4	1-Jan-88	

Isobutyl nitrite	cancer	AB	542-56-3	1-May-96	7.4
Isoprene	cancer	AB	78-79-5	1-May-96	
Isopyrazam	cancer	AB	881685-58-1	24-Jul-12	
Isosafrole Delisted December 8, 2006 [Click here for the basis for delisting]	~~cancer~~	~~LC~~	~~120-58-1~~	~~1-Oct-89~~	
Isotretinoin	developmental	SQE	4759-48-2	1-Jul-87	
Isoxaflutole	cancer	AB	141112-29-0	22-Dec-00	
-	-	-	-	-	
Kresoxim-methyl	cancer	AB	143390-89-0	3-Feb-12	
-	-	-	-	-	
Lactofen	cancer	SQE	77501-63-4	1-Jan-89	
Lasiocarpine	cancer	SQE	303-34-4	1-Apr-88	0.09
Lead	developmental, female, male	LC	---	27-Feb-87	0.5
Lead and lead compounds	cancer	AB	---	1-Oct-92	
Lead					15 (oral)
Lead acetate	cancer	SQE	301-04-2	1-Jan-88	23 (oral)
Lead phosphate	cancer	SQE	7446-27-7	1-Apr-88	58 (oral)
Lead subacetate	cancer	LC	1335-32-6	1-Oct-89	41 (oral)
Leather dust	cancer	LC	---	29-Apr-11	-
Leuprolide acetate	developmental, female, male	FR	74381-53-6	26-Aug-97	
Levodopa	developmental	FR	59-92-7	29-Jan-99	
Levonorgestrel implants	female	FR	797-63-7	15-May-98	

Lindane and other hexachlorocyclohexane isomers	cancer	LC	---	1-Oct-89	
Linuron	developmental	AB	330-55-2	19-Mar-99	460

Lithium carbonate	developmental	FR	554-13-2	1-Jan-91	
Lithium citrate	developmental	FR	919-16-4	1-Jan-91	
Lorazepam	developmental	FR	846-49-1	1-Jul-90	
Lovastatin	developmental	FR	75330-75-5	1-Oct-92	
Lynestrenol	cancer	AB	52-76-6	27-Feb-01	
-	-	-	-	-	
Malonaldehyde, sodium salt	cancer	AB	24382-04-5	29-Apr-11	
Mancozeb	cancer	AB	8018-01-7	1-Jan-90	
Maneb	cancer	AB	12427-38-2	1-Jan-90	
Marijuana smoke	cancer	SQE	---	19-Jun-09	
Me-A-alpha-C (2-Amino-3-methyl-9H-pyrido[2,3-b]indole)	cancer	AB	68006-83-7	1-Jan-90	0.6
Mebendazole	developmental	FR	31431-39-7	20-Aug-99	
Medroxyprogesterone acetate	cancer	AB	71-58-9	1-Jan-90	
Medroxyprogesterone acetate	developmental	FR	71-58-9	1-Apr-90	
Megestrol acetate	developmental	FR	595-33-5	1-Jan-91	
MeIQ (2-Amino-3,4-dimethylimidazo[4,5-f]quinoline)	cancer	AB	77094-11-2	1-Oct-94	0.46
MeIQx (2-Amino-3,8-dimethylimidazo[4,5-f]quinoxaline)	cancer	AB	77500-04-0	1-Oct-94	0.41
Melphalan	cancer	LC	148-82-3	27-Feb-87	0.005
Melphalan	developmental	FR	148-82-3	1-Jul-90	
Menotropins	developmental	FR	9002-68-0	1-Apr-90	
Mepanipyrim	cancer	AB	110235-47-7	1-Jul-08	
Meprobamate	developmental	FR	57-53-4	1-Jan-92	

Mercaptopurine	developmental	FR	6112-76-1	1-Jul-90	
Mercury and mercury compounds	developmental	AB	---	1-Jul-90	
Merphalan	cancer	SQE	531-76-0	1-Apr-88	
Mestranol	cancer	SQE	72-33-3	1-Apr-88	
Metam potassium	cancer	AB	137-41-7	31-Dec-10	
Methacycline hydrochloride	developmental	FR	3963-95-9	1-Jan-91	
Metham sodium	cancer	AB	137-42-8	6-Nov-98	
Metham sodium	developmental	AB	137-42-8	15-May-98	
Methanol	developmental	AB	67-56-1	16-Mar-12	47,000 (inhalation) 23,000 (oral)
Methazole	developmental	AB	20354-26-1	1-Dec-99	
Methimazole	developmental	FR	60-56-0	1-Jul-90	
Methotrexate	developmental	SQE	59-05-2	1-Jan-89	
Methotrexate sodium	developmental	FR	15475-56-6	1-Apr-90	
5-Methoxypsoralen with ultraviolet A therapy	cancer	SQE	484-20-8	1-Oct-88	
8-Methoxypsoralen with ultraviolet A therapy	cancer	LC	298-81-7	27-Feb-87	
2-Methylaziridine (Propyleneimine)	cancer	SQE	75-55-8	1-Jan-88	0.028
Methylazoxymethanol	cancer	SQE	590-96-5	1-Apr-88	
Methylazoxymethanol acetate	cancer	SQE	592-62-1	1-Apr-88	
Methyl bromide, as a structural fumigant	developmental	FR	74-83-9	1-Jan-93	810 (inhalation)
Methyl carbamate	cancer	AB	598-55-0	15-May-98	160
Methyl chloride	developmental	AB	74-87-3	10-Mar-00	
Methyl chloride	male	LC	74-87-3	7-Aug-09	

3-Methylcholanthrene	cancer	AB	56-49-5	1-Jan-90	0.03
5-Methylchrysene	cancer	SQE	3697-24-3	1-Apr-88	0.0084 (oral)
4,4'-Methylene bis(2-chloroaniline)	cancer	FR	101-14-4	1-Jul-87	0.5
4,4'-Methylene bis(N,N-dimethyl)benzenamine	cancer	LC	101-61-1	1-Oct-89	20
4,4'-Methylene bis(2-methylaniline)	cancer	SQE	838-88-0	1-Apr-88	0.8
4,4'-Methylenedianiline	cancer	SQE	101-77-9	1-Jan-88	0.4
4,4'-Methylenedianiline dihydrochloride	cancer	SQE	13552-44-8	1-Jan-88	0.6
Methyleugenol	cancer	AB	93-15-2	16-Nov-01	
Methylhydrazine and its salts	cancer	AB	---	1-Jul-92	
Methylhydrazine					0.058 (oral) 0.090 (inhalation)
Methylhydrazine sulfate					0.18
2-Methylimidazole	cancer	LC	693-98-1	22-Jun-12	.
4-Methylimidazole	cancer	AB	822-36-6	7-Jan-11	29
Methyl iodide	cancer	SQE	74-88-4	1-Apr-88	
Methyl isobutyl ketone	cancer	LC	108-10-1	4-Nov-11	
Methyl isocyanate (MIC)	developmental, female	SQE	624-83-9	12-Nov-10	
Methyl isopropyl ketone	developmental	LC	563-80-4	17-Feb-12	.
Methyl mercury	developmental	SQE	---	1-Jul-87	
Methylmercury compounds	cancer	AB	---	1-May-96	
Methyl methanesulfonate	cancer	SQE	66-27-3	1-Apr-88	7
Methyl n-butyl ketone	male	LC	591-78-6	7-Aug-09	
2-Methyl-1-nitroanthraquinone (of uncertain purity)	cancer	SQE	129-15-7	1-Apr-88	0.2
N-Methyl-N'-nitro-N-nitrosoguanidine	cancer	SQE	70-25-7	1-Apr-88	0.08

N-Methylolacrylamide	cancer	AB	924-42-5	1-Jul-90	
N-Methylpyrrolidone	developmental	AB	872-50-4	15-Jun-01	3200 (inhalation) 17000 (dermal)
α-Methyl styrene (alpha-Methylstyrene)	cancer	LC	98-83-9	2-Nov-12	.
α-Methyl styrene	female	LC	98-83-9	29-Jul-11	.
Methyltestosterone	developmental	FR	58-18-4	1-Apr-90	
Methylthiouracil	cancer	LC	56-04-2	1-Oct-89	2
Metiram	cancer	AB	9006-42-2	1-Jan-90	
Metiram	developmental	AB	9006-42-2	30-Mar-99	
Metronidazole	cancer	SQE	443-48-1	1-Jan-88	
Michler's ketone	cancer	SQE	90-94-8	1-Jan-88	0.8
Midazolam hydrochloride	developmental	FR	59467-96-8	1-Jul-90	
Minocycline hydrochloride (internal use)	developmental	FR	13614-98-7	1-Jan-92	
Mirex	cancer	SQE	2385-85-5	1-Jan-88	0.04
Misoprostol	developmental	FR	59122-46-2	1-Apr-90	
Mitomycin C	cancer	SQE	50-07-7	1-Apr-88	0.00009
Mitoxantrone hydrochloride	developmental	FR	70476-82-3	1-Jul-90	
Molinate	developmental, female, male	AB	2212-67-1	11-Dec-09	
MON 4660 (dichloroacetyl-1-oxa-4-azaspiro(4,5)-decane	cancer	AB	71526-07-3	22-Mar-11	
MON 13900 (furilazole)	cancer	AB	121776-33-8	22-Mar-11	
3-Monochloropropane-1,2-diol (3-MCDP)	cancer	SQE	96-24-2	8-Oct-10	
Monocrotaline	cancer	SQE	315-22-0	1-Apr-88	0.07

MOPP (vincristine-prednisone-nitrogen mustard-procarbazine mixture)	cancer	LC	113803-47-7	4-Nov-11	
5-(Morpholinomethyl)-3-[(5-nitrofurfurylidene)-amino]-2-oxazolidinone	cancer	SQE	139-91-3	1-Apr-88	0.18
Mustard Gas	cancer	LC	505-60-2	27-Feb-87	
MX (3-chloro-4-dichloromethyl-5-hydroxy-2(5H)-furanone)	cancer	SQE	77439-76-0	22-Dec-00	0.11
Myclobutanil	developmental, male	AB	88671-89-0	16-Apr-99	
Nabam	developmental	AB	142-59-6	30-Mar-99	
Nafarelin acetate	developmental	FR	86220-42-0	1-Apr-90	
Nafenopin	cancer	SQE	3771-19-5	1-Apr-88	

Nalidixic acid	cancer	AB	389-08-2	15-May-98	28
Naphthalene	cancer	AB	91-20-3	19-Apr-02	5.8
1-Naphthylamine	cancer	LC	134-32-7	1-Oct-89	
2-Naphthylamine	cancer	LC	91-59-8	27-Feb-87	0.4
Neomycin sulfate (internal use)	developmental	FR	1405-10-3	1-Oct-92	
Netilmicin sulfate	developmental	FR	56391-57-2	1-Jul-90	
Nickel (Metallic)	cancer	LC	7440-02-0	1-Oct-89	
Nickel acetate	cancer	LC	373-02-4	1-Oct-89	
Nickel carbonate	cancer	LC	3333-67-3	1-Oct-89	
Nickel carbonyl	cancer	SQE	13463-39-3	1-Oct-87	
Nickel carbonyl	developmental	AB	13463-39-3	1-Sep-96	
Nickel compounds	cancer	LC	---	7-May-04	

Nickel hydroxide	cancer	LC	12054-48-7; 12125-56-3	1-Oct-89	
Nickelocene	cancer	LC	1271-28-9	1-Oct-89	
Nickel oxide	cancer	LC	1313-99-1	1-Oct-89	
Nickel refinery dust from the pyrometallurgical process	cancer	SQE	---	1-Oct-87	0.8
Nickel subsulfide	cancer	SQE	12035-72-2	1-Oct-87	0.4
Nicotine	developmental	FR	54-11-5	1-Apr-90	
Nifedipine	developmental, female, male	FR	21829-25-4	29-Jan-99	
Nimodipine	developmental	FR	66085-59-4	24-Apr-01	
Niridazole	cancer	SQE	61-57-4	1-Apr-88	
Nitrapyrin	cancer	AB	1929-82-4	5-Oct-05	
Nitrapyrin	developmental	AB	1929-82-4	30-Mar-99	
Nitrilotriacetic acid	cancer	SQE	139-13-9	1-Jan-88	100
Nitrilotriacetic acid, trisodium salt monohydrate	cancer	SQE	18662-53-8	1-Apr-89	70
5-Nitroacenaphthene	cancer	SQE	602-87-9	1-Apr-88	6
5-Nitro-o-anisidine Delisted December 8, 2006 [Click here for the basis for delisting]	~~cancer~~	~~LC~~	~~99-59-2~~	~~1-Oct-89~~	~~10~~
o-Nitroanisole	cancer	AB	91-23-6	1-Oct-92	
Nitrobenzene	cancer	AB	98-95-3	26-Aug-97	
Nitrobenzene	male	AB	98-95-3	30-Mar-10	
4-Nitrobiphenyl	cancer	SQE	92-93-3	1-Apr-88	
6-Nitrochrysene	cancer	AB	7496-02-8	1-Oct-90	
Nitrofen (technical grade)	cancer	SQE	1836-75-5	1-Jan-88	9
2-Nitrofluorene	cancer	AB	607-57-8	1-Oct-90	
Nitrofurantoin	male	AB	67-20-9	1-Apr-91	

Nitrofurazone	cancer	AB	59-87-0	1-Jan-90	0.5
1-[(5-Nitrofurfurylidene)-amino]-2-imidazolidinone	cancer	SQE	555-84-0	1-Apr-88	0.4
N-[4-(5-Nitro-2-furyl)-2-thiazolyl]acetamide	cancer	SQE	531-82-8	1-Apr-88	0.5
Nitrogen mustard (Mechlorethamine)	cancer	SQE	51-75-2	1-Jan-88	
Nitrogen mustard (Mechlorethamine)	developmental	SQE	51-75-2	1-Jan-89	
Nitrogen mustard hydrochloride (Mechlorethamine hydrochloride)	cancer	SQE	55-86-7	1-Apr-88	
Nitrogen mustard hydrochloride (Mechlorethamine hydrochloride)	developmental	FR	55-86-7	1-Jul-90	
Nitrogen mustard N-oxide	cancer	SQE	126-85-2	1-Apr-88	
Nitrogen mustard N-oxide hydrochloride	cancer	SQE	302-70-5	1-Apr-88	
Nitromethane	cancer	AB	75-52-5	1-May-97	39
2-Nitropropane	cancer	SQE	79-46-9	1-Jan-88	
1-Nitropyrene	cancer	AB	5522-43-0	1-Oct-90	
4-Nitropyrene	cancer	AB	57835-92-4	1-Oct-90	
N-Nitrosodiethanolamine	cancer	SQE	1116-54-7	1-Jan-88	0.3
N-Nitrosodiethylamine	cancer	SQE	55-18-5	1-Oct-87	0.02
N-Nitrosodimethylamine	cancer	SQE	62-75-9	1-Oct-87	0.04
N-Nitrosodi-*n*-butylamine	cancer	SQE	924-16-3	1-Oct-87	0.06
N-Nitrosodi-*n*-propylamine	cancer	SQE	621-64-7	1-Jan-88	0.1
p-Nitrosodiphenylamine	cancer	SQE	156-10-5	1-Jan-88	30
N-Nitrosodiphenylamine	cancer	SQE	86-30-6	1-Apr-88	80
3-(N-Nitrosomethylamino) propionitrile	cancer	AB	60153-49-3	1-Apr-90	
4-(N-Nitrosomethylamino)-1-(3-pyridyl)1-butanone	cancer	AB	64091-91-4	1-Apr-90	0.014
N-Nitrosomethylethylamine	cancer	LC	10595-95-6	1-Oct-89	0.03

N-Nitrosomethylvinylamine	cancer	SQE	4549-40-0	1-Jan-88	
N-Nitrosomorpholine	cancer	SQE	59-89-2	1-Jan-88	0.1
N-Nitroso-N-ethylurea	cancer	SQE	759-73-9	1-Oct-87	0.03
N-Nitroso-N-methylurea	cancer	SQE	684-93-5	1-Oct-87	0.006
N-Nitroso-N-methylurethane	cancer	SQE	615-53-2	1-Apr-88	0.006
N-Nitrosonornicotine	cancer	SQE	16543-55-8	1-Jan-88	0.5
N-Nitrosopiperidine	cancer	SQE	100-75-4	1-Jan-88	0.07
N-Nitrosopyrrolidine	cancer	SQE	930-55-2	1-Oct-87	0.3
N-Nitrososarcosine	cancer	SQE	13256-22-9	1-Jan-88	
o-Nitrotoluene	cancer	AB	88-72-2	15-May-98	
Nitrous oxide	developmental, female	AB	10024-97-2	1-Aug-08	
Norethisterone (Norethindrone)	cancer	LC	68-22-4	1-Oct-89	
Norethisterone (Norethindrone)	developmental	FR	68-22-4	1-Apr-90	
Norethisterone acetate (Norethindrone acetate)	developmental	FR	51-98-9	1-Oct-91	
Norethisterone (Norethindrone) /Ethinyl estradiol	developmental	FR	68-22-4/ 57-63-6	1-Apr-90	
Norethisterone (Norethindrone) /Mestranol	developmental	FR	68-22-4/ 72-33-3	1-Apr-90	
Norethynodrel	cancer	AB	68-23-5	27-Feb-01	
Norgestrel	developmental	FR	6533-00-2	1-Apr-90	
Ochratoxin A	cancer	AB	303-47-9	1-Jul-90	
Oil Orange SS	cancer	SQE	2646-17-5	1-Apr-88	
Oral contraceptives, combined	cancer	LC	---	1-Oct-89	
Oral contraceptives, sequential	cancer	LC	---	1-Oct-89	
Oryzalin	cancer	AB	19044-88-3	12-Sep-08	

Oxadiazon	cancer	SQE	19666-30-9	1-Jul-91	
Oxadiazon	developmental	AB	19666-30-9	15-May-98	
Oxazepam	cancer	AB	604-75-1	1-Oct-94	
Oxazepam	developmental	FR	604-75-1	1-Oct-92	
p,p'-Oxybis(benzenesulfonyl hydrazide)	developmental	LC	80-51-3	7-Aug-09	
Oxydemeton methyl	female, male	AB	301-12-2	6-Nov-98	
Oxymetholone	cancer	SQE	434-07-1	1-Jan-88	
Oxymetholone	developmental	FR	434-07-1	1-May-97	
Oxytetracycline (internal use)	developmental	FR	79-57-2	1-Jan-91	
Oxytetracycline hydrochloride (internal use)	developmental	FR	2058-46-0	1-Oct-91	
Oxythioquinox (Chinomethionat)	cancer	AB	2439-01-2	20-Aug-99	
Oxythioquinox (Chinomethionat)	developmental	AB	2439-01-2	6-Nov-98	
Paclitaxel	developmental, female, male	FR	33069-62-4	26-Aug-97	
Palygorskite fibers (> 5mm in length)	cancer	AB	12174-11-7	28-Dec-99	
Panfuran S	cancer	SQE	794-93-4	1-Jan-88	
Paramethadione	developmental	FR	115-67-3	1-Jul-90	
Penicillamine	developmental	FR	52-67-5	1-Jan-91	
Pentachlorophenol	cancer	AB	87-86-5	1-Jan-90	40
Pentobarbital sodium	developmental	FR	57-33-0	1-Jul-90	
Pentostatin	developmental	FR	53910-25-1	1-Sep-96	
Phenacemide	developmental	FR	63-98-9	1-Jul-90	
Phenacetin	cancer	LC	62-44-2	1-Oct-89	300

Phenazopyridine	cancer	SQE	94-78-0	1-Jan-88	4
Phenazopyridine hydrochloride	cancer	SQE	136-40-3	1-Jan-88	5
Phenesterin	cancer	SQE	3546-10-9	1-Jul-89	0.005
Phenobarbital	cancer	AB	50-06-6	1-Jan-90	2
Phenolphthalein	cancer	AB	77-09-8	15-May-98	
Phenoxybenzamine	cancer	SQE	59-96-1	1-Apr-88	0.2
Phenoxybenzamine hydrochloride	cancer	SQE	63-92-3	1-Apr-88	0.3
Phenprocoumon	developmental	FR	435-97-2	1-Oct-92	
o-Phenylenediamine and its salts	cancer	AB	95-54-5	15-May-98	
o-Phenylenediamine					26
o-Phenylenediamine dihydochloride					44
Phenyl glycidyl ether	cancer	AB	122-60-1	1-Oct-90	5
Phenyl glycidyl ether	male	LC	122-60-1	7-Aug-09	
Phenylhydrazine and its salts	cancer	AB	---	1-Jul-92	
Phenylhydrazine					1
Phenylhydrazine hydrochloride					1.4
o-Phenylphenate, sodium	cancer	AB	132-27-4	1-Jan-90	200
o-Phenylphenol	cancer	AB	90-43-7	4-Aug-00	
Phenylphosphine	developmental	LC	638-21-1	7-Aug-09	
PhiP(2-Amino-1-methyl-6-phenylimidazol[4,5-b]pyridine)	cancer	AB	105650-23-5	1-Oct-94	
Pimozide	developmental, female	FR	2062-78-4	20-Aug-99	
Pipobroman	developmental	FR	54-91-1	1-Jul-90	
Pirimicarb	cancer	AB	23103-98-2	1-Jul-08	
Plicamycin	developmental	FR	18378-89-7	1-Apr-90	
Polybrominated biphenyls	cancer	SQE	---	1-Jan-88	0.02

Polybrominated biphenyls	developmental	AB	---	1-Oct-94	
Polychlorinated biphenyls	cancer	LC	---	1-Oct-89	0.09
Polychlorinated biphenyls	developmental	SQE	---	1-Jan-91	
Polychlorinated biphenyls (containing 60 or more percent chlorine by molecular weight)	cancer	SQE	---	1-Jan-88	
Polychlorinated dibenzo-*p*-dioxins	cancer	FR	---	1-Oct-92	
Polychlorinated dibenzofurans	cancer	FR	---	1-Oct-92	
Polygeenan	cancer	SQE	53973-98-1	1-Jan-88	1200
Ponceau MX	cancer	SQE	3761-53-3	1-Apr-88	200
Ponceau 3R	cancer	SQE	3564-09-8	1-Apr-88	40
Potassium bromate	cancer	AB	7758-01-2	1-Jan-90	1
Potassium dimethyldithiocarbamate	developmental	AB	128-03-0	30-Mar-99	720
Pravastatin sodium	developmental	FR	81131-70-6	3-Mar-00	
Prednisolone sodium phosphate	developmental	FR	125-02-0	20-Aug-99	
Primidone	cancer	AB	125-33-7	20-Aug-99	
Procarbazine	cancer	SQE	671-16-9	1-Jan-88	0.05
Procarbazine hydrochloride	cancer	SQE	366-70-1	1-Jan-88	0.06
Procarbazine hydrochloride	developmental	FR	366-70-1	1-Jul-90	
Procymidone	cancer	AB	32809-16-8	1-Oct-94	
Progesterone	cancer	SQE	57-83-0	1-Jan-88	
Pronamide	cancer	AB	23950-58-5	1-May-96	
Propachlor	cancer	AB	1918-16-7	27-Feb-01	
1,3-Propane sultone	cancer	SQE	1120-71-4	1-Jan-88	0.3
Propargite	cancer	AB	2312-35-8	1-Oct-94	

Propargite	developmental	AB	2312-35-8	15-Jun-99	
beta-Propiolactone	cancer	SQE	57-57-8	1-Jan-88	0.05
Propoxur	cancer	AB	114-26-1	11-Aug-06	
Propylene glycol mono-*t*-butyl ether	cancer	AB	57018-52-7	11-Jun-04	
Propylene oxide	cancer	SQE	75-56-9	1-Oct-88	
Propylthiouracil	cancer	SQE	51-52-5	1-Jan-88	0.7
Propylthiouracil	developmental	FR	51-52-5	1-Jul-90	
Pymetrozine	cancer	AB	123312-89-0	22-Mar-11	
Pyridine	cancer	AB	110-86-1	17-May-02	
Pyrimethamine	developmental	FR	58-14-0	29-Jan-99	
Quazepam	developmental	FR	36735-22-5	26-Aug-97	
Quinoline and its strong acid salts	cancer	SQE	---	24-Oct-97	
Quizalofop-ethyl	male	SQE	76578-14-8	24-Dec-99	590
Radionuclides	cancer	SQE	---	1-Jul-89	
Reserpine	cancer	LC	50-55-5	1-Oct-89	0.06
Residual (heavy) fuel oils	cancer	AB	---	1-Oct-90	
Resmethrin	cancer	AB	10453-86-8	1-Jul-08	
Resmethrin	developmental	AB	10453-86-8	6-Nov-98	
Retinol/retinyl esters, when in daily dosages in excess of 10,000 IU, or 3,000 retinol equivalents. (NOTE: Retinol/retinyl esters are required and essential for maintenance of normal reproductive function. The recommended daily level during pregnancy is 8,000 IU.)	developmental	SQE	---	1-Jul-89	

Ribavirin	developmental	FR	36791-04-5	1-Apr-90	
Ribavirin	male	FR	36791-04-5	27-Feb-01	
Riddelliine	cancer	LC	23246-96-0	3-Dec-04	
Rifampin	developmental, female	FR	13292-46-1	27-Feb-01	
Saccharin Delisted April 6, 2001 [Click here for the basis for delisting]	~~cancer~~	~~LC~~	~~81-07-2~~	~~1-Oct-89~~	
Saccharin, sodium Delisted January 17, 2003 [Click here for the basis for delisting]	~~cancer~~	~~SQE~~	~~128-44-9~~	~~1-Jan-88~~	
Safrole	cancer	SQE	94-59-7	1-Jan-88	3
Salted fish, Chinese-style	cancer	LC	---	29-Apr-11	
Secobarbital sodium	developmental	FR	309-43-3	1-Oct-92	
Selenium sulfide	cancer	LC	7446-34-6	1-Oct-89	
Sermorelin acetate	developmental	FR	---	20-Aug-99	
Shale-oils	cancer	AB	68308-34-9	1-Apr-90	
Silica, crystalline (airborne particles of respirable size)	cancer	SQE	---	1-Oct-88	
Sodium dimethyldithiocarbamate	developmental	AB	128-04-1	30-Mar-99	23 (oral) 58 (oral) as a 40% pesticidal formulation
Sodium fluoroacetate	male	AB	62-74-8	6-Nov-98	
Soots, tars, and mineral oils (untreated and mildly treated oils and used engine oils)	cancer	LC	---	27-Feb-87	
Spirodiclofen	cancer	AB	148477-71-8	8-Oct-10	
Spironolactone	cancer	FR	52-01-7	1-May-97	
Stanozolol	cancer	FR	10418-03-8	1-May-97	
Sterigmatocystin	cancer	SQE	10048-13-2	1-Apr-88	0.02

Streptomycin sulfate	developmental		3810-74-0	1-Jan-91	
Streptozocin (streptozotocin)	developmental, female, male	FR	18883-66-4	20-Aug-99	
Streptozotocin (streptozocin)	cancer	SQE	18883-66-4	1-Jan-88	0.006
Strong inorganic acid mists containing sulfuric acid	cancer	AB	---	14-Mar-03	
Styrene oxide	cancer	SQE	96-09-3	1-Oct-88	4
Sulfallate	cancer	SQE	95-06-7	1-Jan-88	4
Sulfasalazine (salicylazosulfapyridine)	cancer	AB	599-79-1	15-May-98	
Sulfasalazine (salicylazosulfapyridine)	male	FR	599-79-1	29-Jan-99	
Sulfur dioxide[e]	developmental	SQE	7446-09-5	29-Jul-11	10000
Sulindac	developmental, female	FR	38194-50-2	29-Jan-99	
Talc containing asbestiform fibers	cancer	AB	---	1-Apr-90	
Tamoxifen and its salts	cancer	SQE	10540-29-1	1-Sep-96	
Tamoxifen citrate	developmental	FR	54965-24-1	1-Jul-90	
Temazepam	developmental	FR	846-50-4	1-Apr-90	
Teniposide	developmental	FR	29767-20-2	1-Sep-96	
Terbacil	developmental	AB	5902-51-2	18-May-99	
Terrazole	cancer	AB	2593-15-9	1-Oct-94	
Testosterone and its esters	cancer	SQE	58-22-0	1-Apr-88	
Testosterone cypionate	developmental	FR	58-20-8	1-Oct-91	
Testosterone enanthate	developmental	FR	315-37-7	1-Apr-90	
3,3',4,4'-Tetrachloroazobenzene	cancer	AB	14047-09-7	24-Jul-12	

2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD)	cancer	SQE	1746-01-6	1-Jan-88	0.000005
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD)	developmental	AB	1746-01-6	1-Apr-91	
1,1,1,2-Tetrachloroethane	cancer	LC	630-20-8	13-Sep-13	
1,1,2,2-Tetrachloroethane	cancer	AB	79-34-5	1-Jul-90	3
Tetrachloroethylene (Perchloroethylene)	cancer	SQE	127-18-4	1-Apr-88	14
p-a,a,a-Tetrachlorotoluene	cancer	AB	5216-25-1	1-Jan-90	
Tetracycline (internal use)	developmental	FR	60-54-8	1-Oct-91	
Tetracyclines (internal use)	developmental	FR	---	1-Oct-92	
Tetracycline hydrochloride (internal use)	developmental	FR	64-75-5	1-Jan-91	
Tetrafluoroethylene	cancer	AB	116-14-3	1-May-97	
Tetranitromethane	cancer	AB	509-14-8	1-Jul-90	0.059
Thalidomide	developmental	SQE	50-35-1	1-Jul-87	
Thioacetamide	cancer	SQE	62-55-5	1-Jan-88	0.1
4,4'-Thiodianiline	cancer	SQE	139-65-1	1-Apr-88	0.05
Thiodicarb	cancer	AB	59669-26-0	20-Aug-99	
Thioguanine	developmental	FR	154-42-7	1-Jul-90	
Thiophanate methyl	female, male	AB	23564-05-8	18-May-99	600 (oral)
Thiouracil	cancer	AB	141-90-2	11-Jun-04	
Thiourea	cancer	SQE	62-56-6	1-Jan-88	10
Thorium dioxide	cancer	LC	1314-20-1	27-Feb-87	
Titanium dioxide (airborne, unbound particles of respirable size)	cancer	LC	---	2-Sep-11	
Tobacco, oral use of smokeless products	cancer	SQE	---	1-Apr-88	
Tobacco smoke	cancer	SQE	---	1-Apr-88	

Tobacco smoke (primary)	developmental, female, male	SQE	---	1-Apr-88	
Tobramycin sulfate	developmental	FR	49842-07-1	1-Jul-90	
Toluene	developmental	SQE	108-88-3	1-Jan-91	7000[c]
Toluene	female	LC	108-88-3	7-Aug-09	
Toluene diisocyanate	cancer	LC	26471-62-5	1-Oct-89	20
o-Toluidine	cancer	SQE	95-53-4	1-Jan-88	4
o-Toluidine hydrochloride	cancer	SQE	636-21-5	1-Jan-88	5
para-Toluidine Delisted October 29, 1999 [Click here for the basis for delisting]	~~cancer~~	~~AB~~	~~106-49-0~~	~~1-Jan-90~~	
Toxaphene (Polychlorinated camphenes)	cancer	SQE	8001-35-2	1-Jan-88	0.6
Toxins derived from *Fusarium moniliforme (Fusarium verticillioides)*	cancer	LC	---	7-Aug-09	
Treosulfan	cancer	LC	299-75-2	27-Feb-87	
Triadimefon	developmental, female, male	AB	43121-43-3	30-Mar-99	
Triazolam	developmental	FR	28911-01-5	1-Apr-90	
S,S,S-Tributyl phosphorotrithioate (Tribufos, DEF)	cancer	AB	78-48-8	25-Feb-11	
Tributyltin methacrylate	developmental	AB	2155-70-6	1-Dec-99	
Trichlormethine (Trimustine hydrochloride)	cancer	AB	817-09-4	1-Jan-92	
Trichloroacetic acid	cancer	LC	76-03-9	13-Sep-13	
Trichloroethylene	cancer	SQE	79-01-6	1-Apr-88	14 (oral) 50 (inhalation)
2,4,6-Trichlorophenol	cancer	SQE	88-06-2	1-Jan-88	10
1,2,3-Trichloropropane	cancer	AB	96-18-4	1-Oct-92	
Trientine hydrochloride	developmental	FR	38260-01-4	27-Feb-01	

Triforine	developmental	AB	26644-46-2	18-Jun-99	
1,3,5-Triglycidyl-s-triazinetrione	male	LC	2451-62-9	7-Aug-09	
Trilostane	developmental	FR	13647-35-3	1-Apr-90	
Trimethadione	developmental	FR	127-48-0	1-Jan-91	
2,4,5-Trimethylaniline and its strong acid salts	cancer	SQE	---	24-Oct-97	
Trimethyl phosphate	cancer	AB	512-56-1	1-May-96	24
Trimetrexate glucuronate	developmental	FR	82952-64-5	26-Aug-97	
2,4.6-Trinitrotoluene (TNT)	cancer	SQE	118-96-7	19-Dec-08	8.2
Triphenyltin hydroxide	cancer	AB	76-87-9	1-Jul-92	
Triphenyltin hydroxide	developmental	AB	76-87-9	18-Mar-02	
Tris(aziridinyl)-p-benzoquinone (Triaziquone) Delisted December 8, 2006 [Click here for the basis for delisting]	~~cancer~~	~~LC~~	~~68-76-8~~	~~1-Oct-89~~	
Tris(1-aziridinyl)phosphine sulfide (Thiotepa)	cancer	SQE	52-24-4	1-Jan-88	0.06
Tris(2-chloroethyl) phosphate	cancer	AB	115-96-8	1-Apr-92	
Tris(2,3-dibromopropyl)phosphate	cancer	SQE	126-72-7	1-Jan-88	0.3
Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)	cancer	SQE	13674-87-8	28-Oct-11	5.4
Trp-P-1 (Tryptophan-P-1)	cancer	SQE	62450-06-0	1-Apr-88	0.03
Trp-P-2 (Tryptophan-P-2)	cancer	SQE	62450-07-1	1-Apr-88	0.2
Trypan blue (commercial grade)	cancer	LC	72-57-1	1-Oct-89	
Unleaded gasoline (wholly vaporized)	cancer	SQE	---	1-Apr-88	
Uracil mustard	cancer	SQE	66-75-1	1-Apr-88	
Uracil mustard	developmental, female, male	FR	66-75-1	1-Jan-92	

Urethane (Ethyl carbamate)	cancer	SQE	51-79-6	1-Jan-88	0.7
Urethane (Ethyl carbamate)	developmental	AB	51-79-6	1-Oct-94	
Urofollitropin	developmental	FR	97048-13-0	1-Apr-90	
Valproate (Valproic acid)	developmental	SQE	99-66-1	1-Jul-87	
Vanadium pentoxide (orthorhombic crystalline form)	cancer	AB	1314-62-1	11-Feb-05	
Vinblastine sulfate	developmental	FR	143-67-9	1-Jul-90	
Vinclozolin	cancer	AB	50471-44-8	20-Aug-99	
Vinclozolin	developmental	AB	50471-44-8	15-May-98	
Vincristine sulfate	developmental	FR	2068-78-2	1-Jul-90	
Vinyl bromide	cancer	SQE	593-60-2	1-Oct-88	
Vinyl chloride	cancer	LC	75-01-4	27-Feb-87	3
4-Vinylcyclohexene	cancer	AB	100-40-3	1-May-96	
4-Vinylcyclohexene	female, male	LC	100-40--3	7-Aug-09	
4-Vinyl-1-cyclohexene diepoxide (Vinyl cyclohexenedioxide)	cancer	AB	106-87-6	1-Jul-90	
Vinyl cyclohexene dioxide (4-Vinyl-1-cyclohexene diepoxide)	female, male	LC	106-87-6	1-Aug-08	
Vinyl fluoride	cancer	AB	75-02-5	1-May-97	
Vinyl trichloride (1,1,2-Trichloroethane)	cancer	AB	79-00-5	1-Oct-90	10
Warfarin	developmental	SQE	81-81-2	1-Jul-87	
Wood dust	cancer	LC	---	18-Dec-09	
2,6-Xylidine (2,6-Dimethylaniline)	cancer	AB	87-62-7	1-Jan-91	110

Zalcitabine	cancer	LC	7481-89-2	7-Aug-09	
Zidovudine (AZT)	cancer	LC	30516-87-1	18-Dec-09	
Zileuton	cancer, developmental, female	FR	111406-87-2	22-Dec-00	
Zineb Delisted October 29, 1999 [Click here for the basis for delisting]	~~cancer~~	~~AB~~	~~12122-67-7~~	~~1-Jan-90~~	

[a] Where a source or product results in exposures by multiple routes, the total exposure must be considered. For example, the MADL for benzene is exceeded when the absorbed dose exceeds 24µg/day. If only inhalation and oral exposure occurs, the benzene MADL is exceeded when: (oral dose ÷ 24 µg/day) + (inhalation dose ÷ 49 µg/day) > 1.0.

[b] Levels for male children and adolescents were calculated by application of the default bodyweights specified in Section 25703(a)(8) to the procedure specified in Sections 25801 and 25803

[c] Level represents absorbed dose (rounded from 6,525 µg/day). Since 100% of ingested toluene is absorbed, oral dose is equivalent to administered dose. It is assumed that roughly 50% of the dose administered by the inhalation route is absorbed. Therefore, the MADL for inhaled toluene is 13,000 µg/day (rounded from 13,050 µg/day), corresponding to an absorbed dose of 6,525 µg/day.

[d] Butyl benzyl phthalate MADL was adopted June 25, 2013, but pursuant to Government Code section 11343.4 it becomes effective October 1, 2013.

[e] Sulfur dioxide MADL was adopted July 11, 2013, but pursuant to Government Code section 11343.4 it becomes effective October 1, 2013.

[f] Hydrogen cyanide and cyanide salts MADLs were adopted on August 7, 2013, but pursuant to Government Code section 11343.4 they become effective October 1, 2013

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Glossary

Aerosols - any non-refillable receptacles made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state. Aerosol includes aerosol dispensers.

Alloy - a metallic material, homogeneous the naked eye, consisting of two or more elements so combined that they cannot be readily separated by mechanical means. Alloys are considered to be mixtures for the purpose of classification under the GHS.

Aspiration - the entry of a liquid or solid chemical product into the trachea and lower respiratory system directly through the oral or nasal cavity, or indirectly from vomiting;

ASTM - the "American Society of Testing and Materials".

BCF - "bio concentration factor".

BOD/COD - "biochemical oxygen demand/chemical oxygen demand".

CA - "competent authority".

Carcinogen - a chemical substance or a mixture of chemical substances which induce cancer or increase its incidence.

CAS - "Chemical Abstract Service".

CBI - "confidential business information".

Chemical identity - a name that will uniquely identify a chemical. This can be a name that is in accordance with the nomenclature systems of the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS), or a technical name.

Competent authority - any national body(ies) or authority(ies) designated or otherwise recognized as such in connection with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Compressed gas - a gas which when packaged under pressure is entirely gaseous at -50°C; including all gases with a critical temperature £ -50°C.

Contact sensitizer - a substance that will induce an allergic response following skin contact. The definition for "contact sensitizer" is equivalent to "skin sensitizer".

Corrosive to metal - a substance or a mixture which by chemical action will materially damage, or even destroy, metals.

Criteria - the technical definition for the physical, health and environmental hazards;

Critical temperature - the temperature above which a pure gas cannot be liquefied, regardless of the degree of compression.

Dermal Corrosion: see skin corrosion;

Dermal irritation: see skin irritation.

Dissolved gas - a gas which when packaged under pressure is dissolved in a liquid phase solvent.

EC_{50} - the effective concentration of a substance that causes 50% of the maximum response.

EC Number or (ECN°) - a reference number used by the European Communities to identify dangerous substances, in particular those registered under EINECS.

ECOSOC - the "Economic and Social Council of the United Nations".

EINECS - "European Inventory of Existing Commercial Chemical Substances".

End Point - physical, health and environmental hazards;

ErC_{50} - EC_{50} in terms of reduction of growth rate.

EU - "European Union".

Explosive article - an article containing one or more explosive substances.

Explosive substance - a solid or liquid substance (or mixture of substances) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic substances are included even when they do not emit gases.

Eye irritation - the production of changes in the eye following the application of test substance to the front surface of the eye, which are fully reversible within 21 days of application.

Flammable gas - a gas having a flammable range with air at 20°C and a standard pressure of101.3kPa.

Flammable liquid - a liquid having a flash point of not more than 93°C.

Flammable solid - a solid which is readily combustible, or may cause or contribute to fire through friction.

Flash point - the lowest temperature (corrected to a standard pressure of 101.3 kPa) at which the application of an ignition source causes the vapors of a liquid to ignite under specified test conditions.

Gas - a substance which (i) at 50 °C has a vapor pressure greater than 300 kPa; or (ii) is completely gaseous at 20 °C at a standard pressure of 101.3 kPa.

GESAMP - "the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection of IMO/FAO/UNESCO/WMO/WHO/IAEA/UN/UNEP."

GHS - "the Globally Harmonized System of Classification and # Labeling of Chemicals".

Hazard category - the division of criteria within each hazard class, e.g., oral acute toxicity includes five hazard categories and flammable liquids includes four hazard categories. These categories compare hazard severity within a hazard class and should not be taken as a comparison of hazard categories more generally.

Hazard class - the nature of the physical, health or environmental hazard, e.g., flammable solid carcinogen, oral acute toxicity.

Hazard statement - a statement assigned to a hazard class and category that describes the nature of the hazards of a hazardous product, including, where appropriate, the degree of hazard;

IARC - the "International Agency for the Research on Cancer".

ILO - the "International Labor Organization".

IMO - the "International Maritime Organization".

Initial boiling point - the temperature of a liquid at which its vapor pressure is equal to the standard pressure (101.3kPa), i.e., the first gas bubble appears.

IOMC - the "Inter-organization Program on the Sound Management of Chemicals".

IPCS - the "International Program on Chemical Safety".

ISO - International Standards Organization.

IUPAC - the "International Union of Pure and Applied Chemistry".

Label - an appropriate group of written, printed or graphic information elements concerning a hazardous product, selected as relevant to the target sector(s),that is affixed to, printed on, or attached to the immediate container of a hazardous product, or to the outside packaging of a hazardous product.

Label element - one type of information that has been harmonized for use in a label, e.g., pictogram, signal word.

LC_{50} (50% lethal concentration) - the concentration of a chemical in air or of a chemical in water which causes the death of 50% (one-half) of a group of test animals.

LD_{50} - the amount of a chemical, given all at once, which causes the death of 50% (one half) of a group of test animals.

$L(E)C_{50}$ - LC_{50} or EC_{50}.
Liquefied gas - a gas which when packaged under pressure, is partially liquid at temperatures above-50°C. A distinction is made between.

High pressure liquefied gas - a gas with a critical temperature between -50°C and+65°C;

Low pressure liquefied gas - a gas with a critical temperature above +65°C.

Liquid - a substance or mixture which at 50°C has a vapor pressure of not more than 300kPa (3bar), which is not completely gaseous at 20 °C and at a standard pressure of 101.3kPa, and which has a melting point or initial melting point of 20°C or less at a standard pressure of 101.3 kPa. A viscous substance or mixture for which a specific melting point cannot be determined shall be subjected to the ASTM D 4359-90 test; or to the test for determining fluidity (penetrometer test) prescribed in section 2.3.4 of Annex A of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

MARPOL - the "International Convention for the Prevention of Pollution from Ships".

Mixture - a mixture or a solution composed of two or more substances in which they do not react.

SDS - "Material Safety Data Sheet" and in this document is used interchangeably with Safety Data Sheet (SDS).

Mutagen - an agent giving rise to an increased occurrence of mutations in populations of cells and /or organisms.

Mutation - a permanent change in the amount or structure of the genetic material in a cell;

NGO - "non-governmental organization".

NOEC - the "no observed effect concentration".

OECD - "The Organization for Economic Cooperation and Development".

Organic peroxide - a liquid or solid organic substance which contains the bivalent -0-0- structure and may be considered a derivative of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term also includes organic peroxide formulation (mixtures).

Oxidizing gas - any gas which may, generally by providing oxygen, cause or contribute to the combustion of other

material more than air does.

Oxidizing liquid - a liquid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.

Oxidizing solid - a solid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.

QSAR - "quantitative structure-activity relationships".

Pictogram - a graphical composition that may include a symbol plus other graphic elements, such as a border, background pattern or color that is intended to convey specific information.

Precautionary statement - a phrase (and/or pictogram) that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product, or improper storage or handling of a hazardous product. Product identifier means the name or number used for a hazardous product on a label or in the SDS. It provides a unique means by which the product user can identify the substance or mixture within the particular use setting (e.g. transport, consumer or workplace).

Pyrophoric liquid - a liquid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air.

Pyrophoric solid - a solid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air.

Pyrotechnic article - an article containing one or more pyrotechnic substances;

Pyrotechnic substance - a substance or mixture of substances designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonative, self-sustaining exothermic (heat-related) chemical reactions.

Readily combustible solid - a substance or mixture of powdered, granular, or pasty form which is dangerous if it can be easily ignited by brief contact with an ignition source, such as a burning match, and if the flame spreads rapidly.

Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria - the latest revised edition of the United Nations publication bearing this title, and any published amendment thereto.

Recommendations on the Transport of Dangerous Goods, Model Regulations - the latest revised edition of the United Nations publication bearing this title, and any published amendment thereto.

Refrigerated liquefied gas - a gas which when packaged is made partially liquid because of its low temperature.

Respiratory sensitizer - a substance that induces hypersensitivity of the airways following inhalation of the substance.

RID - The Regulations concerning the International Carriage of Dangerous Goods by Rail [Annex 1 to Appendix B (Uniform Rules concerning the Contract for International Carriage of Goods by Rail) (CIM) of COTIF (Convention concerning international carriage by rail)], as amended.

SAR - "Structure Activity Relationship".

SDS - "Safety Data Sheet" and in this document is used interchangeably with Material Safety Data Sheet (SDS).

Self-Accelerating Decomposition Temperature (SADT) - the lowest temperature at which self-accelerating decomposition may occur with substance as packaged.

Self-heating substance - a solid or liquid substance, other than a pyrophoric substance, which, by reaction with air and without energy supply, is liable to self-heat; this substance differs from a pyrophoric substance in that it will ignite only when in large amounts (kilograms) and after long periods of time (hours or days).

Self-reactive substance - a thermally unstable liquid or solid substance liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes substances or mixtures classified under the GHS as explosive, organic peroxides or as oxidizing.

Serious eye damage - the production of tissue damage in the eye, or serious physical decay of vision, following application of a test substance to the front surface of the eye, which is not fully reversible within 21 days of application.

Signal word - a word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The GHS uses 'Danger' and 'Warning' as signal words.

Skin corrosion - the production of irreversible damage to the skin following the application of a test substance for up to 4 hours.

Skin irritation - the production of reversible damage to the skin following the application of a test substance for up to 4 hours.

Skin sensitizer - a substance that will induce an allergic response following skin contact. The definition for "skin sensitizer" is equivalent to "contact sensitizer".

Solid - a substance or mixture which does not meet the definitions of a liquid or gas.

SPR - "Structure Property Relationship".

Substance - chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.

Substance which, in contact with water, emits flammable gases - a solid or liquid substance or mixture which, by interaction with water, is liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

Supplemental label element - any additional non-harmonized type of information supplied on the container of a hazardous product that is not required or specified under the GHS. In some cases this information may be required by other competent authorities or it may be additional information provided at the discretion of the manufacturer/distributor.

Symbol - a graphical element intended to succinctly convey information.

Technical name - a name that is generally used in commerce, regulations and codes to identify a substance or mixture, other than the IUPAC or CAS name, and that is recognized by the scientific community. Examples of technical names include those used for complex mixtures (e.g., petroleum fractions or natural products), pesticides (e.g., ISO or ANSI systems), dyestuffs (Color Index system) and minerals.

UNCED - the "United Nations Conference on Environment and Development".

UNCETDG/GHS - the "United Nations Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labeling of Chemicals".

UNITAR - the "United Nations Institute for Training and Research";

UNSCEGHS - the "United Nations Sub-Committee of Experts on the Globally Harmonized System of Classification and Labeling of Chemicals".

UNSCETDG - the "United Nations Sub-Committee of Experts on the Transport of Dangerous Goods". The Hazard Communication Standard requires that manufacturers, distributors and suppliers of hazardous chemicals provide copies of Safety Data Sheets (SDS) to customers.

Chemical Inventory

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Hearing Conservation

1.0 Purpose

1.1. The purpose of this program is to identify and control noise hazards and to protect all personnel who have the potential to develop noise-induced hearing loss. Also, this standard provides all BNB operations with standardized hearing conservation guidelines in order to ensure a uniform level of hearing conservation.

2.0 Scope

1.1. Any time sound levels exceed an 8-hour time-weighted average of 85 decibels on an A-weighted scale or greater, hearing conservation practices must be enacted. The contents of this section provide the minimum standards for reducing and controlling noise exposures.

3.0 Responsibility

3.1 Project Management

3.1.1. Project Management will be responsible for acquiring HS&E Submittals from subcontractors prior to the start of work. When subcontractors are identified who will be generating noise levels greater than a TWA of 85 dBA, it is required that they have a plan to reduce and/or control noise exposure for themselves and other personnel on site. It is recommended that they have a comprehensive hearing conservation program that includes at a minimum:

3.1.1.1. personnel monitoring;
3.1.1.2. noise dosimetry data from typical exposures due to the work performed;
3.1.1.3. noise survey data from typical exposures due to the work performed; and
3.1.1.4. training records for personnel.
3.1.1.5. Project Management must ensure that HS&E Programs, PTPs, and JHAs cover hazardous noise exposures and controls.

3.2 Supervision

3.2.1. Ensure hazardous noise is eliminated or controlled and identified on PTPs. Ensure personnel exposed to hazardous noise levels have adequate training and protection methods. Ensure all visitors and new personnel are advised of high noise areas and provided protection.

3.3 Workers

3.3.1. Workers are responsible for wearing hearing protection when sound levels exceed a TWA of 85 dBA. A chart is attached to this standard that may help workers identify tasks and tools where noise levels may be hazardous. Encourage others—especially new personnel to wear hearing protection as required. Workers must maintain their hearing protection devices and ask for new ones as needed. They must also ask their supervisor for instructions on proper use and care of hearing protection. Lastly, workers must notify supervisors of noise hazards that have not been identified, or problems with hearing protective measures taken.

4.0 Definitions

4.1. Steady Noise - Routine exposure of 15 minutes or greater to steady noise levels of 85 decibels or greater is considered hazardous. Steady noise may be continuous (as with generators), intermittent (as with air compressors), or fluctuating with the sound level varying (as with bulldozers).
4.2. Intermittent/Impulsive Noise – any exposure to impulse noise is hazardous. Hazardous impulse noise is that which exceeds 140 dBA and occurs with non-hazardous intervals greater than one second between peaks.
4.3. 85 dBA TWA – OSHA's action level for hearing conservation.
4.4. PEL – Permissible Exposure Limit

4.5. Noise Reduction Rating (NRR) – a unit of measurement used to determine the effectiveness of hearing protection devices to decrease sound exposure within a given working environment.

5.0 Procedure

5.1 Hazards

All workers shall be protected against the effects of exposure to noise, which exceeds the permissible noise exposure shown in the table, listed below.

5.1.1 Permissible Noise Exposures

Duration per day - Hours	Sound Level - dba	Note: For the purpose of this table, the sound levels in decibels are measured on a standard sound level meter operating on the weighing network with slow meter response. In all cases where the sound levels exceed the values shown, it is recommended that employees be provided with an audiometric examination at the time of employment and at reasonable intervals thereafter not exceeding regulatory requirements.
8	85	
6	87	
4	90	
3	92	
2	95	
1.5	97	
1	100	
0.75	102	
0.5	105	
0.25	110	

5.2 Hazard Controls

5.2.1 Engineering Controls

5.2.1.1. Every hazardous noise exposure is required to be evaluated for engineering solutions such as plywood walls/screens/curtains/walls/barriers to reduce exposures to others. If possible, prefabrication of components in an off-site and controlled environment or tools with manufacturer-recommended noise suppressors may decrease exposing others to hazardous noise on job sites.

5.2.2 Administrative Controls

5.2.2.1. Tools may be labeled with stickers which indicate the type of appropriate hearing protection needed during operation.

5.2.2.2. If hazardous noise cannot be controlled, the area must be isolated via a controlled access zone to prevent exposure to the public and other personnel—barriers and signage may be adequate for isolation.

5.2.2.3. Any area or operation that exposes employees to noise in excess of 85 dba shall be posted as "High Noise Area" or "Hearing Protection Required." In areas posted as "Hearing Protection Required" or "High Noise Area", hearing protection shall be provided and worn at all times. For temporary high noise work areas (85 dba), the area shall be barricaded, and hearing protection provided to anyone requiring access.

5.2.2.4. Hearing conservation programs will cover all employees exposed to noise over 85dBa for 8 hours a day as a part of their normal work activities. Part of enrolling in that program will include training on the hazards of noise exposure and an audiometric exam.

5.2.3 Personal Protective Equipment

5.2.3.1. One-time-use hearing protection must not be re-used.

5.2.3.2. For the majority of construction personnel, hearing protection should be carried on their person or readily available.

5.2.3.3. Appropriate hearing protection devices must be selected by considering the noise level in the work area and the noise reduction rating of the hearing protection.

5.2.3.4. Headphones / earbuds / speakers / non-communication radios that play audio or music are not allowed on BNB projects.

5.3 Training

5.3.1. All workers exposed to levels exceeding 8-hour TWA of 85 dBA must have training on the hazards of working in high noise levels. Training must include the attenuation of various types of hearing protection, along with selection, fitting, use and care of them.

5.3.2. Worker training on their employer's Hearing Conservation Program will include discussions of noise sampling in their work areas, methods to reduce noise exposures (engineering), and PPE available for their use, and its location.

5.4 Annual Audiometric Testing (Washington State only)

5.4.1. BNB Project Management is responsible for ensuring new employees receive access to a baseline audiometric testing within 180 days after the employee's first assignment, which is organized by BNB Safety. Project Management must ensure this testing is provided at no cost to employees. Employees hired for less than one year may be part of a hearing protection audit program as an alternative.

5.4.2. All employees that are exposed to noise that equals or exceeds 85 dBA TWA_8 must have access to annual audiograms for the duration of employment. Each employee must be informed of their testing results, which must indicate any declines or improvements in hearing level.

5.4.3. Annual employee testing results must be compared against the employee's baseline assessment by an audiologist, otolaryngologist, qualified physician, or technician conducting the test to determine if a standard threshold shift has occurred. Baseline audiograms and annual testing results are to be maintained by BNB for the duration of the employee's exposure.

6.0 References

FED / OSHA 29 CFR 1926.52 – Hearing Conservation

L&I WAC 296-817 – Hearing Loss Prevention

CALOSHA Title 8 Subchapter 7 Article 105 – Hearing Conservation

7.0 Attachments

Demolition Permit

Coring & Saw Cutting Checklist

Heat Illness Prevention

1.0 Purpose

1.1. Heat produced stress on the human body must be dissipated in order to allow a person to work safely and efficiently, and to maintain overall good health. Environmental conditions contribute dramatically to the body's ability to efficiently remove this generated heat. Ambient air temperature, humidity, wind and sunshine must all be considered when considering work activities to be performed. Every supervisor must remain constantly mindful of the hazards associated with working in heat, sun, wind and humidity, and ensure that everyone in his or her area(s) of responsibility follows this procedure.

2.0 Scope

2.1. This procedure applies to the control of risk of occurrence of heat illness and shall apply to all outdoor places of employment at those times when the environmental risk factors, as defined in the "Definitions" section are present.

3.0 Responsibility

3.1 Project Management

3.1.1. BNB Project Management and Supervision will ensure that each subcontractor submits an adequate Heat Illness Prevention Plan at least two weeks prior to the subcontractor's start of work.
3.1.2. Each BNB project team will verify that workers on their project have been trained on their respective company's Heat Illness Prevention Plan by requesting a list of trained workers on their company letterhead, on a class roster with the company name, or via employee training cards. Project teams should file the proof of HIPP training behind the subcontractor's HIPP on file.
3.1.3. BNB Project Management & Supervision are to learn, follow, and enforce the contents of this standard and the BNB Heat Illness Prevention Plan.

3.2 Subcontractors

3.2.1. All subcontractors are responsible for implementing their own Heat Illness Prevention Program which includes the training of all workers. Each subcontractor must provide the BNB project team with their company's HIPP not less than two weeks prior to their start of work on a project. Also, each subcontractor must provide a list of trained workers on their company letterhead, on a class roster with the company name, or via employee training cards.
3.2.2. Lastly, subcontractors must identify heat related exposures on their JHA(s) and PTP(s) to ensure control measures are in place and enforced. Subcontractor workers will be responsible for following the requirements set forth in their company's HIPP as well as following control measures identified on their JHAs and PTPs

4.0 Definitions

4.1. Acclimatization - temporary adaptation of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work for at least two hours per day in the heat.
4.2. Heat Illness - a group of serious medical conditions resulting from the body's inability to cope with a particular heat load, and includes heat cramps, heat exhaustion, heat syncope and heat stroke.
4.3. Environmental risk factors for heat illness - working conditions that affect the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.
4.4. Personal risk factors for heat illness - factors such as an individual's age, degree of acclimatization, health, water consumption, alcohol consumption, caffeine consumption, and use of prescription medications that affect the body's water retention or other physiological responses to heat.

4.5. Shade - blockage of direct sunlight. Canopies, umbrellas and other temporary structures or devices may be used to provide shade. One indicator that blockage is sufficient is when objects do not cast a shadow in the area of blocked shade, which is to allow the body to cool. For example, a car sitting in the sun does not provide acceptable shade to a person inside it, unless the car is running with air conditioning.
4.6. Recovery Period - a period of time to recover from the heat in order to prevent heat illness.

5.0 Procedure

5.1 Procedure for Provision of Water

5.1.1. BNB work sites will have provisions of water located inside the jobsite trailer or offices.
5.1.2. Water must be "fresh, pure, suitably cool" and located as close as practicable to where personnel are working, with exceptions when the Senior BNB Team Member can demonstrate infeasibility.
5.1.3. Each subcontractor supervisor will bring adequate amounts of drinking water containers (of 5 to 10 gallons each) to the site, so that at least 2 quarts per employee are available at the start of the shift. The supervisor will also bring adequate quantities of paper cone rims or bags of disposable cups and the necessary cup dispensers to ensure that enough disposable cups are made available for each worker and are kept clean until used. A trash receptacle must also be located in close proximity of the water for the disposal of drinking cups.
5.1.4. Supervisors will check the water level of all containers every 30 minutes, and more frequently when the temperature exceeds 90F. When the water level within a container drops below 50%, water containers will be refilled with cool water. To accomplish this task, each trade supervisor will carry 1 to 2 additional water containers (i.e. 5-gallon bottles) to replace water as needed.
5.1.5. When the temperature exceeds 90 degrees, each trade supervisor will carry ice in separate containers, so that when necessary, it will be added to the drinking water to keep it cool.
5.1.6. Each supervisor will check the work site and place the water as close as possible to the workers (i.e. no more than 50 feet from the workers). If field terrain prevents the water from being placed as close as possible to the workers, each supervisor will bring bottled water or individual containers (in addition to disposable cups and water containers), so that workers can have drinking water readily accessible.
5.1.7. Each supervisor will ensure that the water containers are relocated to follow along as the crew moves, so drinking water will be readily accessible.
5.1.8. Each supervisor will be responsible for cleaning the water containers and ensuring that they are kept in sanitary condition (all necessary cleaning supplies are provided by the company).
5.1.9. The subcontractor company will reimburse their supervisors for any cost incurred for them to fill up their water containers as needed on a daily basis or to purchase necessary disposable cups or cleaning supplies.
5.1.10. Each supervisor will point out daily the location of the water coolers to the workers and remind them to drink water frequently. When the temperature exceeds or is expected to exceed 90 degrees F, each supervisor will hold a brief 'tailgate' meeting each morning to review with employees the importance of drinking water, the number and schedule of water and rest breaks and the signs and symptoms of heat illness.
5.1.11. Each supervisor will use audible devices (such as whistles or air horns) to remind employees to drink water.
5.1.12. When the temperature equals or exceeds 95F or during a heat wave, each supervisor will increase the number of water breaks, and will remind workers throughout the work shift to drink water.

5.2 Procedure for Access to Shade

5.2.1. BNB Staff shall have access to adequate shade located inside the jobsite trailer or offices. Shade must be present at 80 degrees and accommodate all personnel on recovery or rest periods, and those onsite taking meal periods.
5.2.2. Each trade supervisor will bring a minimum of one shade structure to the site, to accommodate all of their employees on the shift and either chairs, benches, sheets, towels or any other items to allow employees to sit and rest without contacting the bare ground. However, chairs, benches, etc. are not required for acceptable sources of shade such as trees.
5.2.3. Each supervisor will ensure that at a minimum of one shade structure is opened and placed as close as practical to the workers, when the temperature equals or exceeds 80F. When the temperature is below 80F, the shade structures will be brought to the site, but will be opened and set in place upon

worker(s) request. Note: The interior of a vehicle may not be used to provide shade unless the vehicle is air-conditioned, and the air conditioner is on.

5.2.4. Each supervisor will point out the daily location of the shade structures to the workers as well as allow and encourage employees to take a 5-minute cool-down rest in the shade, when they feel the need to do so to protect themselves from overheating.

5.2.5. Each supervisor will ensure that the shade structures are relocated to follow along with the crew and double-check that they are as close as practical to the employees, so that access to shade is provided at all times.

5.2.6. In situations where trees or other vegetation are used to provide shade (in sports fields), each supervisor will evaluate the thickness and shape of the shaded area (given the changing angles of the sun during the entire shift), before assuming that sufficient shadow is being cast to protect employees.

5.2.7. In situations where it is not safe or feasible to provide shade, each supervisor will document how this determination was made in their daily reports, and what steps will be taken to provide shade upon request or other alternative cooling measures with equivalent protection.

5.3 Procedure for Monitoring the Weather

5.3.1. Daily, the BNB Project Superintendent will go to www.nws.noaa.gov or a similar website to view the extended weather forecast in order to monitor the weather, plan the work schedule, and to know if a heat wave is expected. In the event of a heat wave, the BNB Superintendent will notify all trade supervisors if schedule modifications will be necessary. This type of advance planning should take place during all summer months. Prior to each workday, the BNB Project Superintendent will review the forecasted temperature and humidity for the worksite and compare it against the National Weather service Heat Index to evaluate the risk level for heat illness. It is important to keep in mind that the temperature at which these warnings occur must be lowered as much as 15 degrees if the workers under consideration are in direct sunlight.

5.3.2. When the temperature exceeds 75 ^{0}F, the trade supervisors will hold short 'tailgate' meetings to review the weather report, reinforce heat illness prevention with all workers and provide reminders to drink water frequently, to be on the lookout for signs and symptoms of heat illness and inform them that shade can be made available upon request.

5.3.3. Once the temperature reaches 80 ^{0}F, the BNBuilders Project Superintendent will be responsible for monitoring the weather for sudden increases in temperature and shade structures are to be opened and accessible to the workers.

5.3.4. Once the temperature equals or exceeds 95 ^{0}F, additional preventive measures such as the High Heat Procedures are to be implemented.

5.4 Procedure for Heat Waves

5.4.1. During a heat wave or heat spike (e.g., a sudden increase in daytime temperature of 9 degrees or more), the workday will be cut short (example 12 PM), will be rescheduled (example conducted at night or during cooler hours) or if possible, cease for the day. If schedule modifications are not possible and workers have to work during a heat wave, each trade supervisor will provide a tailgate meeting to reinforce heat illness prevention with emergency response procedures and review the weather forecast with the workers.

5.4.2. In addition, each supervisor will institute alternative preventive measures such as provide workers with an increase number of water and rest breaks every hour, supervise workers to ensure that they do stop work and take these breaks, and observe closely all workers for signs and symptoms of heat illness.

5.4.3. During a heat wave or heat spike (e.g., a sudden increase in daytime temperature of 9 degrees or more), and the start of the workday, each supervisor will hold a tailgate meeting with the workers to review the company heat illness prevention procedures, the weather forecast and emergency response.

5.4.4. All supervisors will assign each employee a "buddy" to be on the lookout for signs and symptoms of heat illness and ensure that emergency procedures are initiated when someone displays possible signs or symptoms of heat illness.

5.5 Procedure for High Heat (temperature exceeds 95 degrees Fahrenheit)

5.5.1. Each supervisor will ensure effective observation and monitoring, including a mandatory buddy system and regular communication with employees working by themselves. During high heat, personnel must be provided with a minimum 10-minute cool-down period every two hours.
5.5.2. Communication may be made by voice, observation, or electronic means so long as personnel may effectively contact their supervisor. If the supervisor is unable to be near the workers to observe or communicate with them, then an electronic device such as a cell phone may be used for this purpose only if reception in the area is reliable.
5.5.3. During a heat wave, each supervisor will observe all employees closely (or maintain frequent communication via phone or radio) and be alert for possible symptoms of heat illness.
5.5.4. During a heat wave or heat spike (e.g., a sudden increase in daytime temperature of 9 degrees or more), the workday will be cut short (example 12 PM), will be rescheduled (example conducted at night or during cooler hours) or ceased for the day. During the hot summer months, the work shift will start earlier in the day or later in the evening.

5.6 Procedure for Acclimatization

5.6.1. Supervisors will monitor the weather and heat wave(s) and will closely observe all personnel during temperatures of 80 degrees and higher. Supervisors will closely supervise new employees or assign a "buddy"/experienced coworker for the first 14 days of the employee's employment.
5.6.2. For new employees, each supervisor will try to find ways to lessen the intensity of the employee's work during a two-week break-in period (such as scheduling slower paced, less physically demanding work during the hot parts of the day and the heaviest work activities during the cooler parts of the day (early-morning or evening). Steps taken to lessen the intensity of the workload for new employees will be documented. Each supervisor will be extra-vigilant with new employees and stay alert to the presence of heat related symptoms.
Each BNB supervisor will assign new employees a "buddy" or experienced coworker to watch each other closely for discomfort or symptoms of heat illness.
5.6.3. Each supervisor will train employees on the importance of acclimatization, how it is developed and how these procedures address it.

5.7 Procedure for Emergency Response

5.7.1. Emergency response procedures include effective communication, response to signs and symptoms of heat illness and procedures for contacting emergency responders to help stricken workers.
5.7.2. Prior to mobilizing on a project, a member of the BNB Project Team is required to fill out the Crisis Management Plan's section for Emergency Medical Services. Upon completion, the plan shall be posted near the job telephone or otherwise made available to the employees where no job site telephone exists.
5.7.3. Prior to assigning a crew to a particular worksite, each subcontractor supervisor will provide workers and the foreman a map along with clear and precise directions (such as streets or road names, distinguishing features and distances to major roads) of the site, to avoid a delay of emergency medical services.
5.7.4. Prior to assigning a crew to a particular worksite, each supervisor will ensure that a qualified, appropriately trained and equipped person will be available at the site, to render first aid if necessary.
5.7.5. Prior to the start of the shift, each supervisor will determine if a language barrier is present at the site and take steps (such as assigning the responsibility to call emergency medical services to the foreman or an English speaking worker) to ensure that emergency medical services can be immediately called in the event of an emergency.

5.7.6. Supervisors will carry cell phones or other means of communication, to ensure that emergency medical services can be called and check that these are functional at the worksite prior to each shift.
5.7.7. When an employee is showing symptoms of possible heat illness, each supervisor will take immediate steps to keep the stricken employee cool and comfortable once emergency service responders have been called (to reduce the progression to more serious illness).
5.7.8. At remote locations such as rural farms, lots or undeveloped areas, each supervisor will designate an employee or employees to physically go to the nearest road or highway where emergency responders can see them. If daylight is diminished, the designated employee(s) shall be given reflective vest or flashlights in order to direct emergency personnel to the location of the work- site, which may not be visible from the road or highway.
5.7.9. During a heat wave or hot temperatures, workers will be reminded and encouraged to immediately report to their supervisor any signs or symptoms they are experiencing.
5.7.10. Training for employees and supervisors will include every detail of these written emergency procedures.

5.8 Procedure for Handling Sick Workers

5.8.1. If someone displays possible signs or symptoms of heat illness, a trained first aid worker or supervisor will check the person and determine whether resting in the shade and drinking cool water will suffice or if emergency service providers will need to be called. Do not leave a sick worker alone in the shade, as he or she can take a turn for the worse! If someone displays possible signs or symptoms of heat illness and no trained first aid worker or supervisor is available at the site, call emergency service providers.
5.8.2. Employees taking a "preventative cool-down rest" must be monitored for symptoms of heat illness, encouraged to remain in the shade and not ordered back to work until symptoms are gone. Employees with symptoms must be provided appropriate first aid or emergency response.
5.8.3. Call emergency service providers immediately if an employee displays signs or symptoms of heat illness (loss of consciousness, incoherent speech, convulsions, red and hot face), does not look OK or does not get better after drinking cool water and resting in the shade. While the ambulance is in route, initiate first aid (cool the worker: place in the shade, remove excess layers of clothing, place ice pack in the armpits and join area and fan the victim). Do not let a sick worker leave the site, as they can get lost or die (when not being transported by ambulance and treatment has not been started by paramedics) before reaching a hospital!
5.8.4. If an employee does not look OK and displays signs or symptoms of severe heat illness (loss of consciousness, incoherent speech, convulsions, red and hot face), and the worksite is located more than 20 min away from a hospital, call emergency service providers, communicate the signs and symptoms of the victim and request Air Ambulance.

5.9 Training

5.9.1. Training for BNB employees will consist of coverage of this standard and the BNB Heat Illness Prevention Plan.
5.9.2. Training for subcontractor personnel will consist of coverage of the subcontractor's HIPP, this standard, and site-specific heat information.
5.9.3. Each subcontractor supervisor will train workers on the site-specific steps that will be followed for contacting emergency medical services, including how they are to proceed when there are non-English speaking workers, how clear and precise directions to the site will be provided as well as stress the need to make visual contact with emergency responders at the nearest road or landmark to direct them to their worksite.

5.9.4.Prior to working outside, training must be conducted and cover these specific items:

5.9.4.1. Written procedures, standards, HIPP
5.9.4.2. Environmental and personal risk factors for heat illness
5.9.4.3. Procedures for identifying, evaluating, and controlling exposures to the environmental and personal risk factors for heat illness

5.9.4.4. The importance of frequent consumption of small quantities of water, up to 4 cups per hour under extreme conditions of work and heat
5.9.4.5. The importance of acclimatization
5.9.4.6. The different types of heat illness and the common signs and symptoms of heat illness
5.9.4.7. The importance of immediately reporting symptoms of heat illness in oneself or co-workers
5.9.4.8. Procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided should they become necessary
5.9.4.9. Procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider.

6.0 References

CALOSHA Subchapter 7 – General Industry Safety Orders Group 2 – Safe Practices and Personal Protection Article 10 -Personal Safety Devices and Safeguard SS3395 – Heat Illness Prevention

WA L&I 296-307-097 to 296-307-0960 – Safety Standards for Agriculture

7.0 Attachments

OSHA Heat Illness Guidelines

Heavy Equipment

1.0 Purpose

1.1. The use of heavy equipment on BNBuilders Projects introduces a vast array of potential exposures to personnel and the public. The delivery, use, operation, staging, delineation, inspection, etc. of heavy equipment must be planned for prior to equipment arriving on site. The purpose of this standard is to require that equipment is operated in a safe manner; that the equipment is properly maintained; and that ground personnel are properly protected.

2.0 Scope

2.1. This standard addresses requirements and best practices for heavy equipment that operate on BNB projects.

2.2. For additional information, please reference any of the below:

2.2.1. Cranes
2.2.2. Forklifts
2.2.3. Excavation
2.2.4. Utility Avoidance

3.0 Responsibility

3.1 Project Management

3.1.1. Project Management is responsible for:

3.1.1.1. site logistics planning and implementation to minimize exposure of personnel and public to heavy equipment.
3.1.1.2. acquiring and reviewing submittals such as operator training certifications.
3.1.1.3. reviewing completed Pre-Task Plans and Job/Activity Hazard Analysis Forms to ensure inclusion of heavy equipment routes, operations, safe practices, etc.
3.1.1.4. ensuring safe work practices are carried out regarding heavy equipment.

3.2 Workers

3.2.1. Workers are responsible for:

3.2.1.1. following site logistics requirements for the BNB Project.
3.2.1.2. completing an adequate Job/Activity Hazard Analysis and daily Pre-Task Plans that include provisions for heavy equipment.
3.2.1.3. operating, inspecting, documenting, and maintaining equipment in accordance with manufacturer and regulatory requirements.

4.0 Definitions

4.1. **Barricade** - an obstruction to deter the passage of persons or vehicles.
4.2. **Exclusion/controlled access zone –** an area where entry is only permitted to authorized personnel
4.3. **Flagger –** a person who's responsible to signal or warn (a person, automobile, etc.) with a flag
4.4. **Heavy Equipment** - excavators, track hoes, dump trucks, end dumps, bob cats, pavers, rollers, earth moving equipment, forklifts, front-end loaders, scrapers, cranes, etc.
4.5. **Signals** - moving signs, provided by workers, such as flaggers, or by devices, such as flashing lights, to warn of possible or existing hazards.
4.6. **Signs** - the warnings of hazard, temporarily or permanently affixed or placed, at locations where hazards exist.

4.7. Tags - temporary signs, usually attached to a piece of equipment or part of a structure, to warn of existing or immediate hazards.

5.0 Procedure

5.1 General Heavy Equipment Requirements

5.1.1. Pre-Task Plans and Job/Activity Hazard Analyses must identify heavy equipment to be used, associated hazards, and controls. Equipment operators must address the presence of personnel on foot in the areas of their operations. Likewise, personnel on foot in areas with moving equipment must address the equipment hazard in their planning.

5.1.1.1. Personnel should not be within ten feet of moving vehicles without adequate protective measures as outlined in the Hazard Control section of this standard.
5.1.1.2. Personnel shall not alter any equipment or systems without prior approval from the equipment/tool manufacturer and BNB Project Management/Supervision.
5.1.1.3. Cell phone use is not allowed while operating equipment.
5.1.1.4. A valid driver's license is required for operating any vehicle or heavy machinery on the job site or corresponding right-of-way.
5.1.1.5. The speed limit on site, including parking lots, is 10 M.P.H. unless otherwise posted.
5.1.1.6. Engines must not be allowed to idle on BNB Projects. Vehicle engines shall not be allowed to run in closed garages or other enclosed places, unless vents are provided which effectively remove the exhaust gases from the building.
5.1.1.7. Combustible and flammable materials shall be removed from the immediate area prior to operations.
5.1.1.8. Equipment shall be equipped with a fire extinguisher having a 5 BC rating or higher.
5.1.1.9. Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines must have the wheels chocked and the parking brake set.
5.1.1.10. Equipment must have sufficient drip tubs to prevent leaks from contacting the soil. Leaks must be corrected IMMEDIATELY upon observation.
5.1.1.11. If equipment will be leaving the site, track out must be prevented by adequate means.
5.1.1.12. Where vehicles are operated, temporary covers for conduits, trenches and manholes and their supports, when located in roadways and vehicular aisles, shall be designed to carry at least 2 times the maximum intended vehicular live load and they shall be designed and installed as to prevent accidental displacement.
5.1.1.13. No equipment having an obstructed view to the rear will be allowed unless:
5.1.1.13.1. The vehicle has a reverse signal alarm audible above the surrounding noise level.
5.1.1.13.2. The vehicle is backed up only when a flagger, signal person, or spotter signals that it is safe to do so.
5.1.1.13.3. The vehicle is equipped with a back-up camera.
5.1.1.13.4. The operator follows a hands-off-the-controls/levers method when personnel are on foot in the area if feasible.
5.1.1.14. Tools and material shall be secured to prevent movement when transported in the same compartment with employees.
5.1.1.15. When mounting or dismounting a piece of equipment, personnel must maintain three points of contact and face the equipment. Non-slip surfaces should be in place on equipment.
5.1.1.16. Where a hazard exists to personnel because of traffic or haulage conditions at work sites that encroach upon public streets or highways, a system of traffic controls in conformance with the latest edition of "Manual on Uniform Traffic Control Devices for Streets and Highways" shall be required so as to abate the hazard. Additional means of traffic control, such as continuous patrol, detours, hard barricades, or other techniques for the safety of employees may be employed.
5.1.1.17. Slow-moving vehicles (less than 25 mph) driven on public roadways shall be clearly identified by posting a triangular emblem, colored fluorescent yellow-orange with dark red reflective border.
5.1.1.18. Equipment that must pass under overhead utilities must be fully lowered. See Utility

Avoidance.

5.1.2 Roll-Over Protective Structures (ROPS) and Cab Protection

5.1.2.1. ROPS and seat belts shall be installed and used on all equipment that was provided with a ROPS by the manufacturer. ROPS shall provide operator protection against the hazard of falling objects. ROPS system manufacturer's labels must be intact and legible.
5.1.2.2. All cab glass shall be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation.
5.1.2.3. All vehicles with cabs shall be equipped with windshields and powered wipers. Cracked and broken glass shall be replaced. Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields shall be equipped with operable defogging or defrosting devices.
5.1.2.4. All haulage vehicles, whose pay load is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

5.1.3 Required Components

5.1.3.1. All vehicles shall have a service brake system, an emergency brake system, and a parking brake system. These systems may use common components and shall be maintained in operable condition.
5.1.3.2. Whenever visibility conditions warrant additional light, all vehicles, or combinations of vehicles, in use shall be equipped with at least two headlights and two taillights in operable condition.
5.1.3.3. All vehicles, or combination of vehicles, shall have brake lights in operable condition regardless of light conditions.
5.1.3.4. Proximity Alarms – As a best practice, all equipment with a field of vision less than 270 degrees (i.e. rough terrain/all-terrain tele-handlers) should be equipped with an operational proximity alarm (this is different than the back-up alarm requirement). This alarm will have an audio and visual component. Proximity alarms will be installed in a position to best mitigate the blind spot hazard.
5.1.3.5. Quick Hitch Releases – All equipment having quick hitch release mechanisms to change buckets or features on the equipment will be thoroughly reviewed and operators must provide evidence of training and knowledge, of their use and verify safety devices are engaged and fully locked.
5.1.3.6. All vehicles must be equipped with an operable audible warning device (horn) at the operator's station.
5.1.3.7. The wearing of seatbelts is mandatory on all equipment at all times. Riding in the beds of trucks, trailers or in/on any vehicle that does not provide safe seating for passengers is prohibited. Seat belts and anchorages meeting the requirements of 49 CFR Part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards) shall be installed in all motor vehicles.
5.1.3.8. Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried.

5.1.4 Inspection Requirements

5.1.4.1. All heavy equipment shall have a documented inspection at the beginning of each shift to ensure that the equipment is within safe operating conditions as required by the manufacturer and free of apparent damage that could cause failure while in use. All defects shall be corrected before the vehicle is placed in service. See the attached "Heavy Equipment, Forklift, Telehandler Daily Inspection Checklist."
5.1.4.2. Mobile equipment without the proper safety devices shall be reported to the person in charge of equipment maintenance for correction.

5.1.5 Maintenance

5.1.5.1. Maintenance of heavy equipment must be in accordance with manufacturer and other applicable requirements. Only qualified personnel are allowed to maintain equipment and must abide by the BNB Project's requirements and have provisions for lone working (see Lone Work). Maintenance personnel must have and follow written Lock Out Tag Out procedures (or block out procedures. See Electrical). Waste materials and liquids must be properly disposed of.

5.1.5.2. Except for emergency field repairs, a safety tire rack, cage, or equivalent protection shall be used when inflating truck or equipment tires after mounting on a rim, if such tires depend upon a locking ring or similar device to hold them on the rim.

5.1.6 Flaggers

5.1.6.1. A flagger or flaggers shall be utilized at locations on a construction site where barricades and warning signs cannot control the moving traffic. Flaggers shall be utilized in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways published by the State Department of Transportation.

5.1.6.2. Flaggers shall be trained by persons with the qualifications and experience necessary to effectively instruct the employee in the proper fundamentals of flagging moving traffic. Online training resources are available for flagger certification. Certification of flaggers is available for look up by anyone and is stored online.

5.1.6.3. Flaggers must be certified and shall wear warning garments such as vests, jackets, or shirts manufactured in accordance with the requirements of the American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) 107-2004, High Visibility Safety Apparel and Headwear. During the hours of darkness, flaggers' stations shall be illuminated such that the flagger will be clearly visible to approaching traffic and flaggers shall be outfitted with reflectorized garments manufactured in accordance with the requirements of the American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) 107-2004, High Visibility Safety Apparel and Headwear. The retroreflective material shall be visible at a minimum distance of 1,000 feet. White outer garments with retroreflective material that meets the above requirements may be worn during hours of darkness but not during snow or fog conditions, in lieu of colored vests, jackets and/or shirts.

5.1.7 Haulage Vehicle Operation

5.1.7.1. Haulage vehicles shall be under positive control during all periods of operation. When descending grades, the vehicles shall be kept in gear.

5.1.7.2. The operator shall not leave the controls of the vehicle while it is moving under its own engine power.

5.1.7.3. No loading device shall be left unattended until the load or bucket is lowered to the ground, unless proper precautions such as blocking are taken to prevent accidental lowering.

5.1.7.4. Loading buckets, scoops, blades or similar attachments on haulage vehicles which do not provide fall protection shall not be used as work platforms or to elevate or transport personnel.

5.1.8 Fueling

5.1.8.1. No internal combustion engine fuel tank shall be refilled with a flammable liquid while the engine is running. Fueling shall be done in such a manner that the likelihood of spillage is minimal. If a spill occurs, it shall be adequately cleaned up, evaporated, or equivalent action taken to control vapors before restarting the engine. Fuel tank caps shall be replaced before starting the engine.

5.1.8.2. A good metal-to-metal contact shall be kept between fuel supply tank or nozzle of supply hose

and the fuel tank.

5.1.8.3. No open lights, welding, or sparking equipment shall be used near internal combustion equipment being fueled or near storage tanks.

5.1.8.4. No smoking shall be permitted outside of designated areas. Post a conspicuous sign in each fuel storage and fueling area stating: "NO SMOKING WITHIN 50 FEET."

5.1.8.5. Class I liquids shall not be dispensed by pressure from drums, barrels, and similar containers. Approved pumps taking suction through the top of the container or approved self-closing faucets shall be used.

5.1.8.6. No repairs shall be made to equipment while it is being fueled.

5.1.8.7. Each fuel storage tank or drum shall have the word "Flammable" conspicuously marked thereon and should also have a similarly sized word indicating the contents of the container.

5.1.8.8. A dry chemical or carbon dioxide fire extinguisher rated 6:BC or larger shall be in a location accessible to the fueling area.

5.1.9 Pile Driving

5.1.9.1. Boilers and piping systems which are a part of, or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Power Boilers (section I). All pressure vessels which are a part of, or used with, pile driving equipment shall meet the applicable requirements of the American Society of Mechanical Engineers, Pressure Vessels (section VIII).

5.1.9.2. Overhead protection, which will not obscure the vision of the operator shall be provided. Protection shall be the equivalent of 2-inch planking or other solid material of equivalent strength.

5.1.9.3. Stop blocks shall be provided for the leads to prevent the hammer from being raised against the head block.

5.1.9.4. A blocking device, capable of safely supporting the weight of the hammer, shall be provided for placement in the leads under the hammer at all times while employees are working under the hammer.

5.1.9.5. Guards shall be provided across the top of the head block to prevent the cable from jumping out of the sheaves.

5.1.9.6. When the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads.

5.1.9.7. Fixed leads shall be provided with ladder, and adequate rings, or similar attachment points, so that the loft worker may engage his safety belt lanyard to the leads. If the leads are provided with loft platforms(s), such platform(s) shall be protected by standard guardrails.

5.1.9.8. Steam hose leading to a steam hammer or jet pipe shall be securely attached to the hammer with an adequate length of at least 1/4-inch diameter chain or cable to prevent whipping in the event the joint at the hammer is broken. Air hammer hoses shall be provided with the same protection as required for steam lines.

5.1.9.9. Safety chains, or equivalent means, shall be provided for each hose connection to prevent the line from thrashing around in case the coupling becomes disconnected.

5.1.9.10. Guys, outriggers, thrust-outs, or counterbalances shall be provided as necessary to maintain stability of pile driver rigs.

5.1.9.11. Engineers and winchmen shall accept signals only from the designated signalmen.

5.1.9.12. All employees shall be kept clear when piling is being hoisted into the leads.

5.1.9.13. When piles are being driven in an excavated pit, the walls of the pit shall be sloped to the angle of repose or sheet-piled and braced.

5.1.9.14. When steel tube piles are being "blown out", employees shall be kept well beyond the range of falling materials.

5.1.9.15. When it is necessary to cut off the tops of driven piles, pile driving operations shall be suspended except where the cutting operations are located at least twice the length of the longest pile from the driver.

5.1.9.16. When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit.

5.2 Hazards

5.2.1. The following is a list of hazards associated with heavy equipment:

5.2.1.1. Personnel unable to be seen due to their physical positioning (crouched down or standing in a blind spot)
5.2.1.2. Roll/tip over of equipment due to steep grade/incline/soft ground/etc.
5.2.1.3. Struck-by flying objects
5.2.1.4. Hydraulic line damage
5.2.1.5. Leaking/spilling/spraying fluids such as oil, grease, fuel, etc.
5.2.1.6. Contacting overhead and underground utilities
5.2.1.7. Falls from heavy equipment- see Fall protection
5.2.1.8. Exhaust from idling/operating equipment
5.2.1.9. Inappropriate use of a piece of equipment
5.2.1.10. Improperly maintained equipment
5.2.1.11. Broken, disconnected, deactivated safety equipment
5.2.1.12. Blind spots due to equipment configuration

5.3 Hazard Controls

5.3.1 Engineering Controls

5.3.1.1. Site logistics planning considerations:

5.3.1.1.1. Separation of people and equipment by establishing designated travel routes
5.3.1.1.2. Availability of separate site entrances for equipment and people
5.3.1.1.3. Designated and protected break areas

5.3.2 Administrative Controls

5.3.2.1. Exclusion/controlled access zones must be established to keep personnel out of equipment radiuses during operation. Barricades, signage, and cross walks are suitable for establishing exclusion zones.
5.3.2.2. All personnel must be familiar with blind spot parameters. Posters may be erected on project sites where they can be viewed and shown to new hires.
5.3.2.3. Dust generated during use of heavy equipment must be controlled.
5.3.2.4. Spotters, flaggers, and back-up alarms also serve as administrative controls.

5.3.3 Personal Protective Equipment

Personal Protective Equipment for heavy equipment may consist of the following:

5.3.3.1. Cab shielding
5.3.3.2. Personal visibility flag
5.3.3.3. Seat belts
5.3.3.4. Hard hats
5.3.3.5. Eye protection
5.3.3.6. Hearing protection
5.3.3.7. Reflective clothing:

5.3.3.8. Personnel (on foot) exposed to the hazard of vehicular traffic shall wear warning garments such as vests, jackets, or shirts manufactured in accordance with the requirements of the American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) 107-2004, High Visibility Safety Apparel and Headwear. Continued on next page…

5.3.3.9. During hours of darkness, warning garments shall be retro reflective and shall be manufactured in accordance with the requirements of the American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) 107-2004, High Visibility Safety Apparel and Headwear. The retro reflective material shall be visible at a minimum of 1,000 feet. White outer garments with retro reflective material that meets the above requirements may be worn during hours of darkness but not during snow or fog conditions, in lieu of colored vests, jackets and/or shirts.

5.4 Training

5.4.1. Personnel must be trained on:

5.4.1.1. project site logistics features including any separation measures that are in place.
5.4.1.2. safe work practices regarding the dangers of construction machinery.
5.4.1.3. the danger of passing between swinging superstructures of large construction equipment and solid objects.
5.4.1.4. the danger of walking or working within an equipment's operating radius.
5.4.1.5. Operators of equipment must be trained on the specific make and model of equipment. Operators of forklifts, tele-handlers, and cranes must provide proof of training.
5.4.1.6. Flaggers shall be trained in the proper fundamentals of flagging moving traffic before being assigned as flaggers. Signaling directions used by flaggers shall conform to the MUTCD.

5.4.2. The training and instructions shall be based on the MUTCD, work site conditions, and include the following:

5.4.2.1. flagger equipment which must be used,
5.4.2.2. layout of the work zone and flagging station,
5.4.2.3. methods to signal traffic to stop, proceed or slow down,
5.4.2.4. methods of one-way traffic control,
5.4.2.5. trainee demonstration of proper flagging methodology and operations,
5.4.2.6. emergency vehicles traveling through the work zone,
5.4.2.7. handling emergency situations,
5.4.2.8. methods of dealing with hostile drivers,
5.4.2.9. flagging procedures when a single flagger is used (when applicable).

6.0 References

Fed/OSHA 1926.600-603 - Equipment

Cal/OSHA T8 CCR Subchapter 4, Article 11 – Vehicles, Traffic Control, Flaggers, Barricades, and Warning Signs

Cal/OSHA T8 CCR Subchapter 4, Article 10 – Haulage and Earth Moving

L&I WAC Title 296-155-600 to 296-155-630 – Motor Vehicles, Mechanized Equipment, and Marine Operations

L&I WAC Title 296-155-950 to 295-155-965 – Rollover Protective Structures and Overhead Protection

7.0 Attachments

Aerial Work Platform Inspection Checklist

Equipment User Agreement Form

Fall Protection Work Plan

Housekeeping

1.0 Purpose

1.1. Good housekeeping is an essential element of incident prevention. It should be a primary concern to all Staff subcontractors and workers on site. Good housekeeping should be planned at the beginning of the job, carefully supervised and followed to final clean-up. Confusion will be reduced and operations will be more efficient with a higher morale when the work area is clean and orderly. A project that is not organized and clean is not safe.

2.0 Scope

2.1. BNB projects and work areas shall be kept clean at all times. Regular cleaning shall be conducted throughout the course of work in order to maintain safe and sanitary conditions. Housekeeping should be a concern to all personnel.

3.0 Responsibility

3.1 Project Management

3.1.1. BNB Project Management is responsible for ensuring that adequate housekeeping requirements are set forth in contracts with all subcontractors. Project Managers may add an additional provision to contracts that requires composite clean-up (see procedures section). BNB Staff may remedy non-conforming situations as deemed necessary. Project Supervision will ensure that housekeeping is adequate. Project Supervision will also set the tone for housekeeping from the beginning of the project by leading as an example.

3.2 Workers

3.2.1. Each worker is responsible for housekeeping throughout the course of each work task. Workers must ensure that production does not get ahead of clean-up efforts in order to have a safe workplace. Workers must follow requirements in the procedures section of this standard.

4.0 Definitions

4.1. Housekeeping - The maintenance of a construction project.
4.2. Combustible - Capable of catching fire and burning.
4.3. Sweeping Compound - A material that is used to trap dust on flooring prior to sweeping. It can be used on cement, concrete, marble, etc.
4.4. Indoor Air Quality- A term which refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants.
4.5. Composite Clean Up- A crew composed of workers from each trade that works together to perform scheduled clean-up sessions on a site.

5.0 Procedure

5.1 General Housekeeping Procedures

5.1.1. Housekeeping and daily cleanup should be made a priority on all BNB projects. A messy project does not reflect our training, our image nor does it deliver the right message to our customers or our community.
5.1.2. All work areas shall be maintained in a "broom swept" condition at all times to the greatest possible extent. This shall include packing materials, demolition debris, and scrap material, unused or unusable excavated material. If the Subcontractor fails to comply, the Project Manager or designee

will remedy the non-conforming situation and deduct costs incurred from monies owed the Subcontractor.

5.1.3. Debris will not be allowed to accumulate. All trash shall be removed and cleaned up from the site or contained in suitable covered dumpsters, trash bins or similar containers.

5.1.4. Loose materials shall not be stored around the floor perimeter edge or perimeter of floor openings where they can be easily knocked off. All materials shall be maintained in neat stockpiles for ease of access. Keep aisles and walkways clear of loose materials and tools. Materials shall not be placed within six feet of any hoist way or floor openings or within ten feet of any exterior wall that does not extend above the material stored.

5.1.5. Clean up loose materials, waste, etc., immediately. This is especially important in aisles and in the vicinity of ladders, ramps, stairs, and machinery. Tools and loose materials should be removed immediately if a hazard is created. Protruding nails should be removed or bent over as the material is removed. Cleaned lumber should be stacked in orderly piles. Workmen performing this task should wear heavy gloves and puncture-proof insoles.

5.1.6. Empty bottles, containers and papers should not be allowed to accumulate where lunches are eaten on the jobsite. Trash disposal cans shall be provided. Glass bottles are not allowed on the construction site.

5.1.7. Any debris that is dropped more than 20 feet to any point outside the exterior walls of the structure shall be done with the use of a chute or slide. The chute or slide must be enclosed on all sides. Employees and general public shall be protected by flying debris by barricade or other protective means as necessary. A lockout/tagout program, fall protection or other requirements for the removal of clogged material may be required. Before removal of clogged material, a competent person shall review the operation and applicable JHA and PTP.

5.1.8. Tools and materials should not be left on site where they can create a hazard or be stolen. Tools and surplus materials should be returned to storage areas and stored in a safe manner.

5.1.9. Clean up spilled liquids immediately.

5.1.10. Sanitation will be in accordance with OSHA Subpart D 1926 (Sanitation). This references drinking water, toilet facilities, and hand washing stations.

5.1.11. During the course of construction scrap lumber with protruding nails, and all other debris shall be kept cleared from work areas, passageways, and stairs, in and around buildings or other structures. Nails shall be removed or bent over in lumber.

5.1.12. All stairways, passageways, gangways, and crossways must be kept free of material, supplies, and obstructions at all times.

5.1.13. Combustible scrap and debris shall be removed at regular intervals during the course of construction.

5.1.14. Containers shall be provided for the collection and separation of waste, trash, oily and used rags, and other refuse. Containers used for oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc., shall be equipped with labels and covers.

5.1.15. All trash and debris will be removed from all work areas daily. Trash receptacles shall be emptied as needed. All trash/debris must be cleaned up and disposed in the appropriate dumpsters and covered nightly. This includes lunch/break trash. Work areas must be cleaned every day by trades that generate the debris and maintained in a safe working condition. Housekeeping is a condition of employment

5.1.16. Sweeping compound is a requirement of the Site-Specific Safety Plan.

5.1.17. Dust creating activities will take place only in accordance with the IAQ Management Plan. Any alterations in the finished areas will require either temporary dust protection or a vacuum with HEPA filter to collect dust generated.

5.1.18. Strict compliance with the project specific Construction Waste Management Plan is required. Recycled materials include but are not limited to wood, scrap metal, concrete, asphalt, cardboard, and drywall. Construction waste shall only be placed in the appropriately labeled dumpster.

5.1.19. Extension cords, hoses, welding leads, etc., must be run overhead when possible in stairways, aisles, and exit areas.
5.1.20. NO Tobacco or sunflower seeds are allowed on jobsites, (except in designated areas).
5.1.21. No eating in buildings (except BNB designated lunch areas identified by the site logistics plan).
5.1.22. The floor of every workroom shall be kept as dry as possible. Drainage shall be maintained where wet processes are used, and false floors, platforms, mats, or other dry standing places shall be provided, when possible.
5.1.23. To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, loose boards, clutter, and unnecessary holes and openings.
5.1.24. Dry sweeping and the use of compressed air for the cleaning of floors and other surfaces shall be prohibited. If vacuuming is used, the exhaust air shall be HEPA filtered to prevent generation of airborne respirable dust. Gentle wash down of surfaces is preferred.
5.1.25. Work areas and means of access shall be maintained safe and orderly.
5.1.26. Sufficient personnel and equipment shall be provided to ensure compliance with all housekeeping requirements.
5.1.27. Work areas shall be inspected daily for adequate housekeeping and findings shall be recorded on daily inspection reports.
5.1.28. Work will not be allowed in those areas that do not comply with the requirements of this standard.
5.1.29. All stairways, passageways, gangways, and access ways shall be kept free of materials, supplies, and obstructions at all times.
5.1.30. Loose or light material shall not be stored or left on roofs or floors that are not closed in, unless it is safely secured.
5.1.31. Tools, materials, extension cords, hoses, or debris shall not cause tripping or other hazards.
5.1.32. Tools, materials, and equipment subject to displacement or falling shall be adequately secured.
5.1.33. Empty bags having contained lime, cement, and other dust-producing material shall be removed periodically.
5.1.34. Form and scrap lumber and debris shall be cleared from work areas and access ways in and around building storage yards and other structures.
5.1.35. Storage and construction sites shall be kept free from the accumulation of combustible materials.
5.1.36. Weeds and grass shall be kept down.
5.1.37. Rubbish, brush, long grass, or other combustible material shall be kept from areas where flammable and combustible liquids are stored, handled, or processed.
5.1.38. Accumulation of liquids, particularly flammable and combustible liquids, on floors, walls, etc., is prohibited. All spills of flammable and combustible liquids shall be cleaned up immediately.
5.1.39. The storage of materials shall not create a hazard. Bags, containers, bundles, construction materials and other equipment shall be stored in tiers, stacked, blocked or interlocked. They shall be limited in height so that they are stable and secure against falling, sliding, or collapse.
5.1.40. Only designated storage areas are allowed for the storage of material/equipment.
5.1.41. Keep exits, fire alarms boxes, fire extinguishing equipment, and any other emergency equipment visible, accessible, and clear of obstructions at all times (minimum clearance of 36" must be maintained around these items).
5.1.42. Construction sites shall be maintained in a manner that allows emergency vehicles and personnel suitable access to all areas.
5.1.43. The site shall comply with Storm Water Management and Discharge, to prevent any discharges into the storm drain conveyance system; ensure that all areas where water may accumulate are protected to contain water, including wash water, in secondary containment for proper disposal; protect all storm drains in the immediate vicinity to prevent any unauthorized discharges from occurring during the project.

6.0 References

FED / OSHA 29 CFR 1926.25 ; Housekeeping

CAL/OSHA Title 8 Subsection 1531 – Housekeeping

L&I WAC 296-800-220 – Housekeeping

7.0 Attachments

None

Infection Control

1.0 Purpose

1.1. Personnel and the public located within close proximity to construction activities may be potentially exposed to infections, infectious materials, and blood borne pathogens. This standard provides guidance on the protection of personnel and the public from potential exposures to infection.

2.0 Scope

2.1. This standard applies to all BNB project and office locations. This policy will apply but is not limited to work conducted in medical facilities, active sewer systems, laboratories, schools, and other occupied facilities. For infection control pertaining to first responders, please reference the First Aid / CPR Policy.

3.0 Responsibility

3.1 Project Management

3.1.1. BNB Project Management & Supervision must ensure that adequate preplanning is conducted to address infection control for work locations such as health care facilities that may have unique health exposures. The Owner's personnel should be consulted by BNB Project Management & Supervision to address the issue of infection control.

3.1.2. BNB Project Management & Supervision will ensure that personnel who are potentially exposed to infectious materials are thoroughly protected and trained.

3.2 Supervision

3.2.1. Supervisors of workers who are potentially exposed to infectious material must ensure that their personnel are adequately trained, protected, and in compliance with infection control procedures. Supervision must ensure that contaminated materials are properly disposed of in accordance with local ordinances such as the Department of Health Services.

3.3 Workers

3.3.1. Workers must follow "Universal Precautions" when exposed to blood or bodily fluids. They must use soap and water to wash hands frequently, especially when in a medical facility or location where infectious substances are common. They must keep open cuts or wounds protected at all times. Workers must understand and follow infection control procedures when working in a medical facility. Also, workers must have up-to-date immunizations when working in healthcare facilities.

4.0 Definitions

4.1. **Approved disinfectant** - a bleach/water solution in a ration of 1:10 or any commercially available disinfectant
4.2. **Blood** - human blood, human blood components and products made from human blood
4.3. **Blood borne Pathogens** - pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include but are not limited to Hepatitis B virus (HBV) and human immunodeficiency virus (HIV).
4.4. **Engineering Controls** - any controls that isolate or remove the blood borne pathogens hazard from the workplace.
4.5. **Exposure Incident** - a specific eye, mouth, or other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that result from the performance of an employee's duties.
4.6. **First Responder** - any employee who has received accredited training in first aid and/or cardiopulmonary resuscitation (CPR) and has been designated as a person responsible for rendering immediate first aid assistance to persons who require emergency assistance while on a BNB project.
4.7. **Hand Washing Facility** - a facility providing an adequate supply of running potable water, soap, and single use towels or hot air-drying machines.
4.8. **ICRA** - Infection Control Risk Assessment

4.9. MRSA - Methicillin-resistant Staphylococcus Aureus
4.10. Norovirus - a group of related viruses that cause gastroenteritis, or an inflammation of the stomach and intestines
4.11. PICRA - Preconstruction Infection Control Risk Assessment
4.12. Universal Precautions - an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids should be treated as if they were known to be infectious for HIV, HBV, and other blood borne pathogens. It does not matter whose blood or fluids they are; everyone will be treated the same, using "Universal Precautions."

5.0 Procedure

ANY EXPOSURE TO HAZARDOUS SUBSTANCES / INFECTIOUS MATERIALS MUST BE DOCUMENTED AND INVESTIGATED AS AN INCIDENT.

5.1 Hazards

5.1.1. Hazards associated with infection control may consist of the following:
5.1.2. Infections due to exposure to infectious materials, blood borne pathogens, non-disinfected surfaces, contaminated pipes, containers, equipment, etc.
5.1.3. Exposing the public or immunocompromised patients to construction dust, chemicals, materials, waste, etc.

5.2 Hazard Controls

5.2.1 Engineering Controls

5.2.1.1. Engineering or work practice controls that remove or isolate a source of contamination is to be the primary method of prevention. Workers must be trained to identify and follow those controls when they are in use.
5.2.1.2. Separate immunocompromised persons from potential exposure to work activities (i.e., Visqueen barriers and negative air pressure).
5.2.1.3. Sticky floor mats may be used to prevent track out from construction activities.
5.2.1.4. Hard or soft barriers will be erected as required in the ICRA planning process.
5.2.1.5. Piping systems in laboratories and healthcare facilities must be evaluated by qualified personnel prior to disassembly to prevent potential exposure to hazardous contaminants.

5.2.2 Administrative Controls

5.2.2.1. Soap and water or other cleaning agents must be available on each job site. Moreover, they are to be thoroughly used by all responding first aid providers after removal and proper disposition of protective equipment. The hands, along with any exposed body areas, must be cleansed.
5.2.2.2. Break areas must be established outside of work areas and workers must cleanse their hands prior to eating and returning to work.
5.2.2.3. Immunizations should be made available to those who may be potentially exposed.
5.2.2.4. Construction personnel should use separate entrances/exits/elevators/hallways/etc. for access and waste removal. Waste containers should be covered prior to leaving construction areas.
5.2.2.5. Work hours may be limited to nights or off-hour shifts to avoid potential exposures in occupied facilities.
5.2.2.6. Construction equipment should be inspected prior to being brought into facilities where possible contaminants such as leaking water could potentially expose building occupants.

5.2.3 Personal Protective Equipment

5.2.3.1. Any potentially exposed worker must be provided free personal protective equipment to be used when potentially exposed to infectious materials. Some examples of PPE for this purpose may be:
5.2.3.2. Impervious gloves
5.2.3.3. Protective coverings such as Tyvek suits and booties
5.2.3.4. N-95 face masks for areas with airborne hazards (i.e., contaminated air streams and chillers)
5.2.3.5. Face shields to protect from splashes

5.3 Training

5.3.1. All personnel who may be in contact with infectious materials should be provided with "infection control" training that includes information on Blood borne pathogens and MRSA at a minimum.
5.3.2. Those working in medical facilities should be trained on ICRA forms and procedures.

6.0 References

29 CFR 1910.1030 Bloodborne Pathogens

L&I WAC 296-800 – Core Safety

L&I WAC 246-337-060 – Infection Control

CALOSHA Title 8 Subchapter 7 Group 16 Article 109 – Hazardous Substances and Processes

7.0 Attachments

Pre-Task Plan

Injury & Illness Prevention Program

Policy Statement

The health and safety of our employees and everyone else affected by our activities is fundamental to the success of our business. At BNBuilders, we believe that our long-term success as a business is dependent upon the ability to keep our workforce, our business partners, our suppliers, our subcontractors and members of the public safe. Our program is not intended to replace Cal- OSHA or Federal OSHA requirements but to help assist in creating 'Freedom from Danger" on all of our projects.

Every employee in our company plays a critical role in achieving our purpose and vision. Our policy is to create an environment in which no one can get hurt. This is done by providing exemplary positive and inspirational leadership; pursuing every opportunity to eliminate risk by designing in safety; identifying hazards associated with our activities and removing the risk where reasonably practicable, including minimizing environmental impacts.

Each member of Management is responsible for the safety, well-being, and safe work conduct of all persons who report to or are assigned to him or her.

The employees of BNBuilders are considered to be our most valuable asset; their safety is of vital concern. Recognizing its need and responsibility for the safety of our employees, the company considers injury and illness prevention an important and integral part of every operation undertaken.

To carry out the policy, BNBuilders will:

Maintain safe and healthful working conditions

Furnish, within reason, the best available mechanical safeguards and personal protective equipment, where they are needed

Maintain an active and aggressive program, in which all members of management will participate to promote safety awareness among its employees

Provide adequate medical and first-aid facilities for work-related injuries and illnesses Maintain a continuous educational program in safe operating procedures

Insist that all employees observe established safety regulations and practices and use the safety equipment provided.

BNBuilders

Jeff Sebenik – Principal

Southern California Region,

James Awford, Principal

Ross Brown, Principal

Dated: 02/08/2019

1.0 Responsibility

1.1. The Injury and Illness Prevention Program (IIPP) administrator, Safety Director, has the authority and responsibility for implementing the provisions of this program for BNBuilders.
1.2. All BNB Staff are responsible for implementing and maintaining the IIPP in their work areas and for answering personnel questions about the IIPP. A copy of this IIPP is available at each BNBuilders Project and Office.

2.0 Compliance

2.1. Management is responsible for ensuring that all safety and health policies and procedures are clearly communicated and understood by all employees. BNB Staff are expected to enforce the rules fairly and uniformly.
2.2. All employees are responsible for using safe work practices, for following all directives, policies and procedures, and for assisting in maintaining a safe work environment.
2.3. Our system of ensuring that all workers comply with the rules and maintain a safe work environment include:
2.3.1. Informing workers of the provisions of our IIPP;

2.3.2. Evaluating the safety performance of all workers;

2.3.3. Recognizing employees who perform safe and healthful work practices;

2.3.4. Providing training to workers whose safety performance is deficient; and

2.3.5. Disciplining workers for failure to comply with safe and healthful work practices.

2.4 Disciplinary Action Procedure

2.4.1. BNB reserves the right to immediately take the appropriate action to eliminate inappropriate behavior or lack of satisfactory performance. Violation of FREEDOM FROM DANGER requirements and regulations may result in disciplinary action, up to and including termination of employment or removal from the project.
2.4.2. BNBuilders does not utilize a formal progressive disciplinary procedure and disciplinary action is not implemented in any particular order. Disciplinary action may include any one or more of the following:
2.4.3. Verbal Warning – *A specific and direct conversation to communicate that a person is not meeting expectations or needs to change behavior.* A BNBuilders' representative shall complete a FREEDOM FROM DANGER Disciplinary Action Form. A copy of the form will be kept on file in the project office.
2.4.4. Written Warning – *A formal written notice to document a person's inappropriate behavior or lack of satisfactory performance.* A BNBuilders' representative and the employee's Superintendent/Supervisor shall complete and issue a FREEDOM FROM DANGER Disciplinary Action Form. Please note that the issued written warning could also include probation, suspension, and/or termination. The written warning is to be routed to: BNB Staff, Workers, and Subcontractor's Office. A copy of the form will be kept on file in the project office.
2.4.5. Termination/Removal from the Project – Follow above procedure for "Written Warning."

3.0 Communication

3.1. We recognize that open, two-way communication between management and staff on safety and health issues is essential to an injury-free, productive workplace. The following system of communication is designed to facilitate a continuous flow of safety and health information between management and staff in a form that is readily understandable and consists of one or more of the following checked items:
3.1.1. New worker orientation including a discussion of safety and health policies and procedures.

3.1.2. Review of our IIPP.

3.1.3. Workplace safety and health training programs.

3.1.4. Regularly scheduled safety meetings.

3.1.5. Effective communication of safety and health concerns between workers and Superintendent/Supervisors, including translation where appropriate.

3.1.6. Posted or distributed safety information.

3.1.7. A system for workers to anonymously inform management about workplace hazards.

3.1.8. Communication of safety and health information starts with the senior executive level and is then disseminated to project management teams.

3.2 Weekly Management Communication

3.2.1. Items communicated to management weekly may consist of:

3.2.1.1. Health, safety and environmental incidents

3.2.1.2. Open workers compensation claims

3.2.1.3. Regulatory Agency Inspections/Activity

3.2.1.4. Weekly health, safety and environmental information update

3.2.1.5. Health, safety and environmental Training

3.2.1.6. FREEDOM FROM DANGER Best Practices

3.2.1.7. Preconstruction Meetings

3.2.1.8. Crane pre-pick planning

3.2.1.9. Utility Strike Prevention Meetings

3.2.1.10. High-risk activities

3.3 Monthly Regional FREEDOM FROM DANGER Training

3.3.1. Regional monthly FREEDOM FROM DANGER training is to be conducted according to training needs. To help determine needs, the following should be looked at:

3.3.1.1. Recent incident trends

3.3.1.2. Lagging/Leading indicators

3.3.1.3. Best practices

3.3.1.4. Corporate training requirements

3.3.1.5. Regulatory training requirements

3.4 Quarterly Regional Communication

3.4.1. Quarterly Regional communication may include the following:

3.4.1.1. Regional Incident Recaps with Lessons Learned

3.4.1.2. Best Practices

3.4.1.3. Accomplishments

3.4.1.4. FREEDOM FROM DANGER Awards

3.4.1.5. Statistics and Injury Rates

3.4.1.6. Lagging Indicators

3.4.1.7. Special FREEDOM FROM DANGER topics

3.4.1.8. Completed/In-Progress/Upcoming training statistics

3.5 Monthly Regional Health, Safety and Environmental Committee Meetings

3.5.1. Monthly FREEDOM FROM DANGER committee meetings help promote communication among all stake holders to ensure FREEDOM FROM DANGER issues are addressed at project and Regional levels. The purpose of safety committee meetings is to:

3.5.1.1. Promote continuous improvement of BNB's FREEDOM FROM DANGER processes;

3.5.1.2. Allow employees/workers to participate in the identification of FREEDOM FROM DANGER issues;

3.5.1.3. Facilitate creative solutions to FREEDOM FROM DANGER concerns;

3.5.1.4. Promote best practices within BNB; and

3.5.1.5. Provide an opportunity for participation, involvement, feedback and promote safety awareness for all personal.

3.5.2. These meetings will be held once per month with meeting minutes kept. The meeting should discuss the following as well as include a job walk with operations/project management:

3.5.2.1. Review business arising from previous meeting;

3.5.2.2. Review Regional incident trends;

3.5.2.3. Review Regional/project FREEDOM FROM DANGER issue;

3.5.2.4. Discuss upcoming high hazard trade work;

3.5.2.5. Discuss new business

3.6 Monthly Regional FREEDOM FROM DANGER Department Meetings

3.6.1. Monthly Regional FREEDOM FROM DANGER department meetings help promote communication among the FREEDOM FROM DANGER department and operations staff. The purpose of these meetings is to:

3.6.1.1. Review open claims;

3.6.1.2. Review incidents from the past month;

3.6.1.3. Address new regulatory standards;

3.6.1.4. Discuss FREEDOM FROM DANGER assessment hot topics;

3.6.1.5. Provide an open forum for operations staff and general Superintendent/Supervisors to talk about FREEDOM FROM DANGER topics

3.7 Project Communication

3.7.1. Project communication is where we provide the hourly workforce with the required FREEDOM FROM DANGER information to keep them involved in our FREEDOM FROM DANGER process through:

3.8 Job-Site Postings & Signage

3.8.1. Job-sites will make available and post in a conspicuous location federal, state, local, and BNB required postings and signage. The BNB job-site branding catalog will be used to acquire mandatory and optional signage.

3.9 Weekly All-Hands FREEDOM FROM DANGER Meetings

3.9.1. The purpose of the Weekly All-Hands FREEDOM FROM DANGER Meetings is to provide timely information on health, safety, and environment items that relate to project activities.
3.9.2. Weekly All-Hands Meetings shall be conducted by Superintendent/Supervisors and/or foreman and provide an important communication link to each employee. Project teams may request assistance from the Regional Safety Department for content or special presentations.
3.9.3. All project personnel are required to attend the Weekly All-Hands Meeting.
3.9.4. Each employee must print and sign their name on the sign in sheet. Anyone missing must be informed about important items from their direct Superintendent/Supervisor.
3.9.5. The Weekly All-Hands Meeting may consist of the following items:
3.9.6. Review minutes of the Regional FREEDOM FROM DANGER Committee Meeting
3.9.7. FREEDOM FROM DANGER Weekly Update via email;
3.9.8. At-risk behaviors, practices, or conditions that have been observed;

3.9.8.1. Review of inspections, incidents, and Safety Data Sheets;

3.9.8.2. Encourage employee suggestions and discussions and decide on corrective action(s);

3.9.8.3. Brief the crew on new types of equipment and controlled products;

3.9.8.4. Review first aid and emergency procedures, update current changes;

3.9.8.5. Discuss any FREEDOM FROM DANGER risk(s) on the project; and/or

3.9.8.6. Use the results of the safety inspections or audits as a source of discussion items.

3.10 SAFETY Stand Downs

3.10.1. Safety stand downs may be held when necessary and could be for the following:

3.10.1.1. High risk safety issues

3.10.1.2. Repeat issues

3.10.1.3. Failure to control risk

3.10.1.4. Failure to implement a Corrective Action Plan

3.10.1.5. Occurrence of a significant incident

3.10.1.6. Arrival of a regulatory inspector

3.10.1.7. Recognition for safety achievement

3.11 Weekly Freedom from Danger Committee Meetings

3.11.1. These meetings are required to be held on a weekly basis for each project. Information gathered during these meetings is to be disseminated to each crew person. Items identified during these meetings that require corrective action must receive adequate follow up to ensure closure.

3.11.2. Topics/Activities that may be covered during these meetings may consist of:

3.11.2.1. Meeting minute review from previous meeting

3.11.2.2. Job safety, health and environmental walk

3.11.2.3. Previous job safety, health and environmental walks

3.11.2.4. Above and beyond safety, health and environmental practices or personnel

3.11.2.5. Training activities

3.11.2.6. High-hazard activities

3.11.2.7. Upcoming work coordination

4.0 Hazard Assessment

4.1. Periodic inspections are performed daily, weekly, monthly, and quarterly. Inspections are conducted

4.1.1. When we initially established our IIP Program;

4.1.2. When new substances, processes, procedures or equipment which present potential new hazards are introduced into our workplace;

4.1.3. When new, previously unidentified hazards are recognized;

4.1.4. When occupational injuries and illnesses occur;

4.1.5. When we hire and/or reassign permanent or intermittent workers to processes, operations, or tasks for which a hazard evaluation has not been previously conducted; and

4.1.6. Whenever workplace conditions warrant an inspection

4.2 All personnel must inspect their work areas and activities daily

4.2.1. Hazards identified must be corrected immediately and reported to BNB Staff. Inspections are to be documented and available upon request for review by BNB Staff.

4.2.2. Every person on a BNBuilders' project is expected to take responsibility for FREEDOM FROM DANGER. If a hazard is observed, it must be corrected and reported immediately.

4.2.3. Unsafe and/or unhealthy work conditions/practices identified will be evaluated and corrected in a timely manner. Under no circumstance will personnel be required or permitted to work under hazardous conditions. Hazards that cannot be corrected immediately will be followed up to ensure closure. Once corrected, notification shall be furnished to the BNB Staff.

4.3 BNB Project Team Procedures

4.3.1. Corrective action that is taken will be explained on inspection forms. Immediate correction shall be initiated for any unsafe acts or conditions. Results of inspections will be discussed in the weekly safety meeting. If applicable, any conditions or acts noted during the inspections which are the direct responsibility of a subcontractor maybe communicated in writing to that subcontractor on the *Disciplinary Action Program Form.* This documentation is to be filed at the project office and scanned to the jobsite file.

4.4 Daily and Weekly Inspections

4.4.1. A daily job walk inspection will be conducted by the BNB Staff with the purpose of observing the conditions and work activities with respect to overall compliance with the FREEDOM FROM DANGER requirements. The jobsite inspection will be documented via Smart Device on BNB's Safety App.

4.5 Weekly Safety Professional Inspection

4.5.1. A weekly job walk inspection and audit will be conducted by the BNB Safety Team with the purpose of observing the conditions and work activities with respect to overall compliance with the FREEDOM FROM DANGER requirements. The weekly inspection will be documented via the *Field Leading Indicator Report*. Observations will be communicated to BNB Staff Members upon completion of inspection.

4.6 Quarterly Inspection

4.6.1. An Executive Management Freedom from Danger Walk will be conducted once per quarter.

5.0 Incident/Exposure Investigations

5.1. Procedures for investigating workplace incidents and hazardous substance exposures include:

5.1.1. Visiting the accident scene as soon as possible;

5.1.2. Interviewing injured workers and witnesses;

5.1.3. Examining the workplace for factors associated with the incident/exposure;

5.1.4. Determining the cause of the accident/exposure;

5.1.5. Taking corrective action to prevent the incident/exposure from reoccurring; and

5.1.6. Recording the findings and corrective actions taken.

5.2. Investigations are conducted by completing the Incident Report Form for all reported injuries/illnesses/utility strikes/first aid/near misses involving BNB employees and all contractor employees working under a BNB contract, i.e. subcontractors (all tiers), suppliers, vendors, visitors, owners' representatives and members of the public.

5.3. All personnel are required to report **all** on-the-job injuries, illnesses, utility strikes, first aid cases or near misses immediately to their Superintendent/Supervisor. All incidents, no matter how minor must be reported this is a condition of continued employment with BNBuilders.

6.0 Hazard Correction

6.1. Unsafe or unhealthy work conditions, practices or procedures shall be corrected in a timely manner based on the severity of the hazards. Hazards shall be corrected according to the following procedures:

6.1.1. When observed or discovered;

6.1.2. When an imminent hazard exists, which cannot be immediately abated without endangering employee(s) and/or property, we will remove all exposed workers from the area except those necessary to correct the existing condition. Workers necessary to correct the hazardous condition shall be provided with the necessary protection; and

6.1.3. All such actions taken and dates they are completed shall be documented.

7.0 Training & Instruction

7.1. All workers, including managers and Superintendent/Supervisors, shall have training and instruction on general and job-specific safety and health practices. Training and instruction shall be provided as follows:

7.1.1. When the IIPP is revised;

7.1.2. To all new employees;

7.1.3. To all workers given new job assignments for which training has not previously provided;

7.1.4. Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard;

7.1.5. Whenever the employer is made aware of a new or previously unrecognized hazard;

7.1.6. To Superintendent/Supervisors to familiarize them with the safety and health hazards to which workers under their immediate direction and control may be exposed; and

7.1.7. To all workers with respect to hazards specific to each employee's job assignment.

7.2 BNB New Employee Orientations

7.2.1. Items covered during new employee training include, but are not limited to, the following:

7.2.1.1. Explanation of the IIPP, emergency response plan and fire prevention plan, and measures for reporting any unsafe conditions, work practices, injuries and when additional instruction is needed.

7.2.1.2. Use of appropriate clothing, including gloves, footwear, and personal protective equipment.

7.2.1.3. Information about chemical hazards to which employees could be exposed and other hazard communication program information.

7.2.1.4. Availability of toilet, hand-washing and drinking water facilities.

7.2.1.5. Provisions for medical services and first aid including emergency procedures.

7.2.2. Each BNBuilders' employee will receive New Hire Orientation during the on-boarding process. New Employee Orientation is designed to introduce personnel to BNBuilders Health, Safety and Environmental requirements. The New Employee Orientation is intended to be a brief overview and does not take the place of task or program safety, health and environmental training.

7.2.3. We train our personnel on the following subjects:

7.2.3.1. Our Code of Safe Work Practices

7.2.3.2. The Regional FREEDOM FROM DANGER Manual

7.2.3.3. The Regional BNB Website

7.2.3.4. Field operations

7.2.3.5. Site Logistics

7.2.3.6. Site and Task-Specific Hazards (fall protection, confined spaces, etc. as needed)

7.3 Project Orientation

7.3.1. This will cover all project-specific health, safety and environmental related issues. The Project Orientation Checklist will be used as minimum guidelines for the project.
7.3.2. Prior to starting work on any BNB project, a Project Orientation is to be conducted. These orientations are to be conducted on an as-needed basis for new personnel onsite, including visitors, vendors and suppliers. Subcontractor Personnel must have gone through an orientation for their company before reporting to a project-specific health, safety and environmental orientation.
7.3.3. All attendees will be issued a hard hat sticker upon completion of the Project Orientation.

7.4 Subcontractor Weekly Toolbox Safety Meetings

7.4.1. Subcontractor employees shall be kept informed of the requirements of the subcontractor's Safety Programs and hazards on the job site through weekly toolbox safety meetings. The subcontractor's Superintendent/Supervisor or their designee will coordinate these meetings. All subcontractor workers are required to attend these meetings. Copies of the sign-in roster including the topics covered must be provided to the BNB Staff.

7.5 All-Hands Weekly Safety Meetings

7.5.1. Weekly All-Hands Meetings shall be conducted by Superintendent/Supervisors and/or foreman and provide an important communication link to each employee. Project teams may request assistance from the Regional Safety Department for content or special presentations. All project personnel are required to attend the Weekly All-Hands Meeting.

7.6 Task-Specific Safety Training

7.6.1. We provide specific instructions to all workers regarding hazards unique to their job assignment, to the extent that such information
7.6.2. was not already covered in other training. When needed, employees will be provided with additional training and information to maintain their knowledge according to federal, state, and local regulatory requirements.
7.6.3. This may include training and instruction in the following areas:
7.6.3.1. General safety and health work practices.

7.6.3.2. Specific instruction with respect to hazards unique to the job assignment.

7.6.3.3. When a new program is first established.

7.6.3.4. To all employees given a new job assignment for which training has not previously been received.

7.6.3.5. Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard, and whenever supervision is made aware of new or previously unrecognized hazards.

7.6.4. If a worker's job description requires any special training, documentation must be provided at orientation. If it is not available, workers will not be allowed to perform work for which safety training documentation is required. Special training, as it applies, may involve, but are not limited to the following topics:

7.6.4.1. Aerial or Boom Lift and Scissor Lift

7.6.4.2. Arc Flash

7.6.4.3. Asbestos and Lead Awareness

7.6.4.4. Blood borne Pathogens

7.6.4.5. Confined Space

7.6.4.6. Competent Person

7.6.4.7. Crane Operation

7.6.4.8. Defensive Driving Safety

7.6.4.9. Excavation/Trenching

7.6.4.10. Fall Protection

7.6.4.11. First Aid ƒ CPR

7.6.4.12. Flagging

7.6.4.13. Forklift Operation

7.6.4.14. Hazard Communications (GHS update training)

7.6.4.15. Ladders

7.6.4.16. Lockout ƒ Tag out

7.6.4.17. Respiratory Illnesses (COVID-19, Etc.)

7.6.4.18. Respiratory Protection

7.6.4.19. Rigging

7.6.4.20. Scaffolding

7.6.4.21. Tele-handler Training

7.6.5. Competent/Qualified Persons

7.6.5.1. Competent/Qualified persons will be identified in writing and documentation of their training must be submitted to BNB staff before they begin work. The assigned competent/qualified person is expected to be a part of all pre-task plan discussions as it pertains to the work being performed.

7.6.6. Supervision

7.6.6.1. It is expected that supervision will have documentation of specific training required by their employers. If they are required to supervise and discuss pre-task plans or evaluate safety, the training must be part of their job.

7.6.6.2. All Superintendent/Supervisors/foremen overseeing one or more personnel are required to have completed OSHA 30 Hour Training within 4 years to remain current in safety, health and environmental issues.

8.0 Recordkeeping

8.1. We have taken the following steps to implement and maintain our IIP Program:

8.1.2. Records of hazard assessment inspections, including the person(s) or persons conducting the inspection, the unsafe conditions and work practices that have been identified and the action taken to correct the identified unsafe conditions and work practices, are recorded and documented; and

8.1.3. Documentation of safety and health training for each worker, including the worker's name or other identifier, training dates, type(s) of training, and training providers are recorded on a worker training and instruction form. We also include the records relating to worker training provided by a construction industry occupational safety and health program approved by Cal/OSHA.

8.2. Inspection records will be maintained via the safety department for an indefinite period and training documentation will be maintained by the Human Resources department per BNB national standard operating procedures.

9.0 Code of Safe Work Practices

9.1. All personnel shall follow these safe practices and render every possible aid to safe operations.

9.2. Work shall be well planned and supervised to prevent injuries.

9.3. Never work at any height where there is a risk of injury from falling or in any situation six feet or more above a surface unless fall prevention measures are in place.

9.4. Never enter an agreed exclusion zone or restricted area unless directed to do so by the person in charge and the work activity has been halted and any suspended load has been lowered.

9.5. Never work in or around unsupported ground of any depth where there is a risk of injury from ground movement or in any situation four feet or more below the ground surface unless ground support measures are in place.

9.6. Never be closer than ten feet from moving mobile equipment or vehicles.

9.7. Never work on mechanical, electrical, or pressurized systems unless the energy source has been isolated, discharged, and verified through testing.

9.8. Never lift a load that exceeds the capacity of the equipment.

9.9. Never perform a hoisting operation when a person is in the drop/swing zone.

9.10. Never use a tool or a piece of equipment for anything other than its intended purpose.

9.11. Never work around water or open fluid facilities without wearing a personal flotation device and never work without a partner who is qualified and equipped to rescue.

9.12. Never use a phone or handheld radio while operating a vehicle or mobile equipment.

9.13. Never commence or continue a task without proper protective arrangements in place to protect others (shielding, exclusion zone, delineation, etc.)

9.14. Never work alone without effective arrangements in place to locate and rescue in the event of becoming incapacitated.

9.15. Personnel shall not enter manholes, underground vaults, chambers, tanks, silos, or other similar places with poor ventilation unless it has been determined that is safe to enter.

9.16. The project shall be kept clean and orderly.

9.17. No one under the influence or in possession of drugs or alcohol is allowed.

9.18. Smoking is not allowed on site.

9.19. Horseplay, scuffling, and other acts that tend to have an adverse influence on the safety or well-being of personnel shall be prohibited.

9.20. No one shall knowingly be permitted or required to work while their ability or alertness is so impaired by fatigue, illness, or other causes that it might unnecessarily expose them or others to injury.

9.21. No loose or frayed clothing or shorts are allowed.

9.22. Inappropriate footwear or shoes with thin or badly worn soles are not allowed.

9.23. Shirts with a minimum 4-inch-long sleeve shall be worn at all times.

9.24. Hard hats, eye protection, reflective vests/shirts, and cut-resistant gloves shall be worn at all times.

9.25. Task-specific personal protective equipment shall be worn at all times (respirators, face shields, goggles, foot guards, ear plugs, etc.)

9.26. All nails and protruding tie wire shall be bent over or removed.

9.27. Vertical and horizontal impalement hazards must be protected (stakes, rebar, etc.)

9.28. Replace guard rails or missing hole covers immediately.

9.29. Personnel shall not handle or tamper with any electrical equipment, machinery, or air or water lines in a manner not within the scope of their duties, unless they have received instructions from their Superintendent/Supervisor.

9.30. Ladders shall be properly inspected and used.

9.31. Always use proper lifting procedures-- avoid twisting while lifting.

9.32. Clean up all liquid spills immediately.

9.33. Materials, tools, or other objects shall not be thrown from buildings or structures until proper precautions are taken to protect others from the falling objects.

9.34. Know the location of fire extinguishers, emergency exits, first aid supplies, etc.

9.35. No one shall bring any type of music playing device, iPod, MP3 player, or DVD/Television device on to the job. The use of headphones is not allowed.

9.36. Immediately report any of the following to a Superintendent/Supervisor or member of the BNB Project Team. If possible, correct the condition first and then report it.

9.36.1. Injury

9.36.2. Illness
9.36.3. Near miss
9.36.4. Utility strike incident
9.36.5. Defective equipment
9.36.6. Unsanitary conditions
9.36.7. Unsafe conditions and/or behavior
9.36.8. Damage to scaffolds, false work or other supporting structures

Heat Illness Prevention Plan

COVID-19

10.0 NEW EMPLOYEE IIPP ACKNOWLEDGEMENT

All new employees of BNBuilders are required to read and understand this Injury & Illness Prevention Program. Additional training will be provided to personnel based on their job assignment and task–specific hazards that they may encounter.

This signed acknowledgement is to be maintained in each employee's personnel file at the respective head office.

BNBuilders is dedicated to providing a safe and healthful workplace for our employees. Your health and safety must always be the first priority in any situation. Should you encounter any situation that you feel is not safe, or that could be improved in regard to safety, let your Superintendent/Supervisor know immediately.

Please sign in the space provided below certifying that you have read and fully understand the contents of this document. Upon signing, this form will become a permanent part of your personnel file.

I have read, and I understand the contents of this Injury & Illness Prevention Program. Employee

Employee	Date
Superintendent/Supervisor	Date

Job Hazard Analysis

1.0 Purpose

1.1. To provide instruction on the creation and use of Job Hazard Analysis (JHA) to evaluate and recognize the hazards associated with work tasks and select proper controls to prevent unsafe acts and conditions.

2.0 Scope

2.1. This policy applies to all JHA's created by BNBuilders or subcontractors.

3.0 Responsibility

3.1 Project Management

3.1.1. BNB Project Management is responsible for ensuring all self-performed work and subcontractor work is covered on an existing site-specific JHA. Management is also responsible for verifying all field employees working under a specific JHA have been trained and have signed the JHA.

3.2 Supervision

3.2.1. Superintendents / Foreman are responsible for helping field crews create and implement JHA's for all work task they encounter. Specifically, the JHA should outline every activity necessary to complete a scope of work, all safety hazards associated with that scope and steps to mitigate these hazards.

3.3 Safety

3.3.1. BNB Safety will be responsible for reviewing and assisting in the building out of JHA's for difficult or unique work tasks.

3.4 Workers

3.4.1. Field employees are responsible for reviewing and signing each JHA that they work under. If an employee does not feel the JHA adequately covers the work task, they should not sign the JHA.

4.0 Definitions

4.1. Job Hazard Analysis – means an evaluation of your working conditions for a specific task to determine which hazards are present and how you will avoid these unsafe acts or conditions.

5.0 Procedure

5.1. See included JHA form below:

Job Hazard Analysis

ACTIVITY:	DATE:
	PROJECT:
DESCRIPTION OF WORK:	SITE SUPERVISOR:
	REVIEWED BY:
	REVIEW FOR LATEST USE:

WORK ACTIVITY SEQUENCE	POTENTIAL HEALTH & SAFETY HAZARDS	HAZARD CONTROLS
	* * *	* * *
	* * *	* * *
	* * *	* * *
	* * *	* * *
	* * *	* * *

Job Hazard Analysis - Page 1 of 3

6.0 References

L&I WAC 296-800 – Core Safety

FEDOSHA 3071 – Job Hazard Analysis

CALOSHA – Subchapter 7 Group 2 Article 10 – Personal Safety Devices and Safeguards

7.0 Attachments

JHA Form

Pre-Task Plan

Ladders

1.0 Purpose

1.1. The purpose of this standard is to ensure the safe use, inspection, maintenance, and proper construction of ladders on BNB projects.

2.0 Scope

2.1. This procedure applies to occasions when BNB employees and / or Subcontractor employees use ladders.

3.0 Responsibility

3.1 Project Management

3.1.1. Ideally, management and supervision should aim to eliminate the use of ladders as much as feasible by supporting the use of alternate methods for reaching work areas at various heights-- for example, mechanical and mobile lifts such as elevated work platforms with guardrails. However, in various situations where ladders need to be used, Project Management & Supervision are responsible for ensuring that safe ladder practices are followed.

3.2 Workers

3.2.1. Workers are responsible for trying to use alternate methods in lieu of ladders for reaching their work areas at height. When ladders are used, workers must ensure they follow safe ladder practices.

4.0 Definitions

4.1. Access – A means of reaching a workspace or a work area.
4.2. Double Cleat Ladder - A ladder that is similar to a single cleat ladder, but is wider, with an additional center rail which will allow for two-way traffic for workers in ascending and descending.
4.3. Extension Ladder - A ladder consisting of two or more sections, with guides or brackets so arranged that the ladder may be adjusted to different lengths by sliding and locking the movable section or sections.
4.4. Hole - Any opening in a floor or platform, which is smaller than an opening.
4.5. Job-built ladder - A ladder that is fabricated by employees, typically at the construction site, and is not commercially manufactured. (Job-built ladders must be constructed in accordance with ANSI Standard A14.4 1979).
4.6. Ladder - A device other than a ramp or stairway, designed for use in ascending or descending at an angle with the horizontal. A ladder is intended to be stationary while in service and consists of two side pieces called side rails, joined at short intervals by crosspieces called steps, rungs or cleats.
4.7. Leading Edge - The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.
4.8. Opening - An opening in any floor or platform, 12 inches or more in the least horizontal dimension. It includes stairway floor openings, ladder way floor openings, hatchways and chute floor openings.
4.9. Personal Fall Arrest System - A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.
4.10. Personal Fall Protection System - A personal fall protection system includes personal fall arrest systems, positioning device systems, fall restraint systems, safety nets and guardrails.
4.11. Single Cleat Ladder - A ladder consisting of a pair of side rails connected together by cleats, rungs, or steps.
4.12. Shall – Mandatory.
4.13. Stepladder - A ladder having treads and so constructed as to be self-supporting.
4.14. Trestle Ladder - A ladder consisting of two special, single ladders hinged together at the top to form equal angles with the surface on which they stand.

4.15. Wall opening – a gap or void 30 inches or more high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level.

5.0 Procedure

5.1 Safe Ladder Practices – General

5.1.1. Only the following ladder types shall be used:
5.1.1.1. Type 1 (250 lbs. maximum rated capacity),
5.1.1.2. Type 1A (300 lbs. maximum rated capacity),
5.1.1.3. Type 1AA (375 lbs. maximum rated capacity)
5.1.2. Ladders must not be loaded beyond the manufacturer's rated capacity
5.1.3. Ladders constructed primarily of metal shall not be used
5.1.4. Manufactured wood or trestle ladders shall not be used
5.1.5. Ladders shall be used according to their intended design
5.1.6. Specialty ladders shall only be used with BNB approval
5.1.7. Whenever possible, use work platforms in lieu of work ladders.
5.1.8. A fall protection system shall be used when a worker is exposed to other potential fall hazards such as leading edges, open floor/wall holes or window openings while working and/or ascending or descending from a ladder
5.1.9. Only ladder rungs, not the side rails, shall be used while ascending or descending ladders
5.1.10. Users shall keep their body in between the side rails of a ladder and not overreach
5.1.11. Do not carry equipment or materials while ascending or descending ladders
5.1.12. Users must face ladders and maintain 3 points of contact at all times while working and/or ascending or descending from a ladder
5.1.13. Ladders must be equipped with non-skid safety feet
5.1.14. Ladders shall be placed on a stable and level footing at all times
5.1.15. Ladders shall not be used on ice, snow or slippery surfaces
5.1.16. Do not place ladders in passageways, doorways, driveways, or any location where they may be displaced by other work activities, unless protected by barricades or someone dedicated to watch and warn both the user and others that might approach the work area
5.1.17. Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height
5.1.18. Ladder feet shall not be wrapped with plastic or carpeting
5.1.19. At the base of a ladder, the landing surface must be clear and smooth (for example, when ladders are used to access rebar mats in an excavation, a piece of secured plywood would be an adequate landing).
5.1.20. Avoid excessive pulling and pushing while on a ladder.
5.1.21. Job-built ladders should only be built by qualified carpenters and according to OSHA and ANSI standards.
5.1.22. Get help when moving large/heavy ladders.
5.1.23. Never store material or tools on the steps of a ladder.
5.1.24. Employees shall be trained on ladder use/safety as part of their employer's safety program.

5.1.25 Inspection / Maintenance

5.1.25.1. Visually inspect ladders prior to use. Never use ladders with broken, bent or missing rungs or steps, broken or split side rails, missing labels, or other faulty or defective construction. Ensure movable parts operate freely without binding or undue play.
5.1.25.2. Damaged ladders shall be tagged as defective and removed from service.
5.1.25.3. Ensure the side rails, cleats, and/or rungs of ladders are kept clear and free of lines, hoses, cables, wires, oil, mud, ice, grease, and debris.

5.1.25.4. Ensure areas around the top and bottom of ladders are kept clear of materials, tools, equipment and debris.

5.2 Safe Ladder Practices – Extension Ladders

5.2.1. Extension ladders shall be setup at a 1:4 base to height ratio
5.2.2. Side rails must extend at least 3 ft. above the upper landing
5.2.3. Tie, block, or otherwise secure ladders to prevent them from being displaced or moved
5.2.4. Extension ladders shall only be adjusted while standing at the base
5.2.5. Workers shall not stand on the top three rungs of an extension ladder
5.2.6. Extension ladders shall only be used with the rung locks engaged
5.2.7. Always be aware of overhead hazards when setting up an extension ladder
5.2.8. For heavier ladders, two people are required to erect and move the ladder
5.2.9. A step-through system should be used when possible at the top of ladder landings

5.3 Safe Ladder Practices -Stepladders

5.3.1. Always fully open and lock side braces when using stepladders
5.3.2. Stepladders shall not be used for access and egress to elevated work areas
5.3.3. Step ladders shall not be used as a straight ladder or in the partially closed position
5.3.4. Do not place planks on the top or on any step of a stepladder
5.3.5. Never stand on the top two steps or top cap of a stepladder
5.3.6. Never climb on the rear side of a one-sided stepladder
5.3.7. Never straddle a stepladder
5.3.8. Place all four feet of the ladder on even and solid footing
5.3.9. Do not "walk" ladders.

5.4 Safe Ladder Practices – Job-Built Ladders

5.4.1. Job-built ladders must be constructed in accordance with ANSI Standard A14.4 1979
5.4.2. Job-built ladders must be constructed for intended use and must safely support the intended load.
5.4.3. If a ladder is to provide the only means of access or exit from a working area for 25 or more employees, or simultaneous two-way traffic is expected, a double-cleated ladder shall be installed.
5.4.4. Double-cleated ladders must not exceed 24 ft. in length
5.4.5. Single-cleat ladders must not exceed 30 ft. in length
5.4.6. The width of single-cleat ladders shall be at least 15 inches, but not more than 20 inches, between rails at the top.
5.4.6.1. Rail splicing is permitted only when there is no loss of strength to the rail
5.4.7. Rails must be made from select Douglas fir without knots
5.4.8. 2x4 inch lumber shall be used for side rails of single cleat ladders up to 16 feet long; 2x6 inch lumber shall be used for single-cleat ladders from 16 to 30 feet in length.
5.4.9. 2x4 inch lumber will be used for side and middle rails of double-cleat ladders up to 12 feet in length; 2x6 inch lumber for double-cleat ladders from 12 to 24 feet in length.
5.4.10. Inset cleats into the edges of the side rails ½ inch, or filler blocks shall be used on the rails between the cleats. Secure the cleats to each rail with three 10d common wire nails or other fasteners of equivalent strength. Uniformly space cleats at 12 inches top-to-top.

5.5 Hazards

5.5.1. Falls are the most common cause of worker injury associated with ladder use. Falls are mostly caused by:

5.5.1.1. Use of faulty ladders
5.5.1.2. Improper set-up of ladders
5.5.1.3. Incorrect use of ladders

5.6 Hazard Controls

5.6.1 Engineering Controls

5.6.1.1. The use of permanent or temporary stair towers will eliminate the risk of falls from using ladders for access.
5.6.1.2. Measures should be taken to eliminate the use of ladders as much as feasible by supporting the use of alternate methods for reaching work areas at various heights-- for example, mechanical and mobile lifts such as elevated work platforms with guardrails. Ladders should be considered as a last resort to gain access to work areas and/or work positions.

5.6.2 Administrative Controls

5.6.2.1. Ladder inspections are to be completed daily before the ladder is used.

5.7 Training

5.7.1 Ladder users shall be trained on the following:

5.7.1.1. Safe ladder practices outlined in this standard
5.7.1.2. Importance of using ladders safely including injuries due to falls from ladders.
5.7.1.3. Selection of ladders, including types, proper length, maximum working loads, and electrical hazards.
5.7.1.4. Maintenance, inspection, and removal of damaged ladders from service.
5.7.1.5. Erecting ladders including footing support, top support, securing, and angle of inclination.
5.7.1.6. Climbing and working on ladders including user's position and points of contact with the ladder.
5.7.1.7. Causes of falls, including haste, sudden movement, lack of attention, footwear, and user's physical condition.
5.7.1.8. Prohibited uses including climbing on cross bracing, uses other than designed, exceeding maximum lengths, and not meeting minimum overlap requirements.
5.7.1.9. All manufacturer requirements and instructions

6.0 References

FED / OSHA 29 CFR 1926 Subpart X – Stairways and Ladders

CAL / OSHA T8 Article 25 - Ladders

L&I WAC 296-876 – Ladders, Portable and Fixed

ANSI A.14.1 – 1990

7.0 Attachments

Pre-Task Plan

Lighting

1.0 Purpose

1.1. Adequate lighting and illumination plays a big role in safe working environments and preventing incidents. Glare, diffusion, direction, uniformity, and brightness affect visibility and the ability to see easily, accurately, and quickly. Poor lighting is uncomfortable and possibly hazardous.

2.0 Scope

2.1. This standard applies to all walking and working areas of every BNB project. The desirable quantity of light for any particular installation depends primarily upon the work that is being done. As the illumination of the task is increased, the ease, speed, and accuracy of accomplishing it are also increased. Work areas must have adequate lighting—headlamps alone are not an acceptable method for task lighting.

3.0 Responsibility

3.1 Project Management

3.1.1. Project Management and Supervision will ensure that each worker has adequate lighting for the tasks they are performing. Project Management and Supervision will ensure that adequate access and egress lighting is provided, however it is the responsibility of the contractors to provide task lighting.

3.2 Workers

3.2.1. BNB employees & subcontractors will ensure that lighting is not less than the minimum illumination intensities listed in Attachment 1 while any work is in progress. BNB crews & subcontractors shall provide temporary lighting where needed in order to maintain illumination levels in work areas, storage areas and walkways.

4.0 Definitions

4.1. **Foot-candle** – A unit of illuminance or illumination, equivalent to the illumination produced by a source of one candle at a distance of one foot and equal to one lumen incident per square foot. Abbreviation: FC
4.2. **Illumination Level** – The quantity or amount of light falling on a surface (usually expressed in foot candles).
4.3. **Intensity (Luminous Intensity)** – The quantity of light a source gives off in a given direction (expressed in candelas--formerly "candle")
4.4. **Lamp** - any man-made light source
4.5. **Lumen** – The flux falling on a surface of one square foot in area, every part of which is one foot from a point source having a luminous intensity of one candela (candlepower) in all directions
4.6. **Luminaire** – A complete lighting device consisting of lamps and parts to distribute the light
4.7. **Luminance (Photometric Brightness)** – The amount of light emitted and reflected from an area of a surface measured in foot lamberts. A surface emitting one lumen per square foot has a luminance of one-foot lambert
4.8. **Reflectance** – A measure of how much light is reflected from a surface. It is the ratio of luminance to illumination

5.0 Procedure

5.1 Hazards

5.1.1. Inadequate lighting may lead to incidents and injuries such as slips, trips, falls, struck-byes, caught-in-betweens, contact with unguarded electrical, and more. Working during non-daylight hours may increase the hazard of poor lighting.

5.1.2. Temporary lighting cords must be routed and secured properly, so that they are out of walkways and not in contact with any conductive surfaces or objects. Temporary lights that emit hazardous heat must

be properly protected and prevented from contacting personnel/materials/equipment that could burn. Temporary lights that have cages to protect the bulb must have the cages intact. Wobble lights must be shut down at night and must not have equipment/tools plugged into them which exceed the light's amperage rating.

5.2 Hazard Controls

5.2.1 Engineering Controls

5.2.1.1. When adequate natural illumination or permanent artificial illumination cannot be made available to secure the safety of employees, suitable portable lights shall be provided.

5.2.1.2. Skylights, side windows, lamps, and other light accessories which provide necessary illumination shall be kept sufficiently clean, adjusted, and repaired so as not to impair the illumination required for the safety of workers.

5.2.2 Administrative Controls

5.2.2.1. Areas with insufficient lighting should be barricaded to prevent being accessed.

5.2.3 Personal Protective Equipment

5.2.3.1. Dark safety glasses should not be worn indoors. Only clean and clear safety glasses should be worn in doors.

Foot-Candles	Area of Operation/Task
5	General construction area lighting
3	General construction areas, concrete placement, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas
20	Indoors: warehouses, corridors, hallways, exit ways, elevators, active storage rooms, traffic areas in garages. Loading platforms. Materials-loading/trucking.
5	Tunnels, shafts, and general underground work areas: (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading)
10	General construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active storerooms, mess halls, and indoor toilets and workrooms.)
30	First aid stations, infirmaries, and offices. Assembly-rough, easy seeing. Woodworking-rough sawing
50	Inspection. Paint dipping/spraying. Sheet metal-presses, shears. Welding.
100	Assembly-medium, Electrical equipment/testing. Offices.

200	Drafting Rooms-detailed, difficult inspection

6.0 References

FED / OSHA 29 CFR 1926.56 – Illumination

CAL / OSHA T8 CCR 1523 - Illumination

L&I WAC 296-56-60221 - Illumination

L&I WAC 296-800 – Core Safety

7.0 Attachments

Pre-Task Plan

Lock Out Tag Out Policy

1. Purpose

1.1. This establishes BNBuilders policy for protecting employees and/or subcontractors who must do service or maintenance on machines or equipment and who could be injured by an unexpected start-up or release of hazardous energy. Service or maintenance includes erecting, installing, constructing, repairing, adjusting, inspecting, unjamming, setting up, troubleshooting, testing, cleaning, and dismantling machines, equipment, or processes.
1.2. This policy will ensure that machinery or equipment is stopped, isolated from all hazardous energy sources, and properly locked or tagged out.

2. Scope

2.1. This policy applies to all BNBuilders employees and subcontractors who may be exposed to hazardous energy during service or maintenance work.
2.2. Uncontrolled energy includes potential, kinetic, flammable, chemical, electrical, and thermal sources.

3. Responsibilities

3.1. BNB Staff are responsible for implementing and enforcing this policy.
3.2. All employees, subcontractors and service providers must comply with this policy.
3.3. Supervisors must enforce the use of lockout and tagout devices when employees do service or maintenance work and may be exposed to hazardous energy.
3.4. Employees who do service and maintenance work must follow the lockout/tagout procedures described in this policy.
3.5. Employees who work in areas where lockout/tagout procedures are used must understand the purpose of the procedures and are prohibited from attempting to restart machines or equipment that are locked or tagged out.

4. Definitions

4.1. **Affected employee -** A person who uses equipment that is being serviced under lockout or tagout procedures, or who works in an area where equipment is being serviced.
4.2. **Authorized employee** - A person who locks out or tags out equipment to do service or maintenance work. An affected employee becomes an authorized employee when that employee's duties include service or maintenance work on equipment.
4.3. **Capable of being locked out -** An energy-isolating device that is designed with a hasp or other means of attachment to which, or through which a lock can be affixed, or if it has a locking mechanism built into it. Other energy-isolating devices will also be considered to be capable of being locked out, if lock out can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy-control capability.
4.4. **Disconnect** - A switch that disconnects an electrical circuit or load (motor, transformer, or panel) from the conductors that supply power to it. An open circuit does not allow electrical current to flow. Under a lockout procedure, a disconnect must be capable of being locked in the open position.
4.5. **Energized** - Connected to an energy source or containing potential energy.
4.6. **Energy source** - Any source of energy. Examples: electrical, mechanical, hydraulic, pneumatic, chemical, and thermal.
4.7. **Energy-isolating device** - A mechanical device that physically prevents transmission or release of energy.
4.8. **Hazardous energy** - Any of the types of energy existing at a level or quantity that could be harmful to workers or cause injury through inadvertent release or start-up of equipment.
4.9. **Lockout device** - A device that locks an energy-isolating device in the safe position.
4.10. **Lockout** - Placing a lockout device on an energy-isolating device, under an established procedure, to ensure the energy-isolating device and the equipment it controls can't be operated until the lockout device is

removed. (An energy-isolating device is capable of being locked out if it has a hasp that accepts a lock or if it has a locking mechanism built into it.)

4.11. Procedure - A series of steps taken to isolate energy and shut down equipment.

4.12. Servicing or maintenance - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining machines or equipment. Also includes lubricating, cleaning, unjamming, and making adjustments or tool changes if a worker may be exposed to the unexpected startup of the equipment during such activities.

4.13. Tagout device - A prominent warning sign, such as a tag, that can be securely fastened to an energy-isolating device to indicate that the energy-isolating device and the equipment it controls can't be operated until the tagout device is removed.

4.14. Tagout - Placing a tagout device on an energy-isolating device, under an established procedure, to indicate that the energy-isolating device and the equipment it controls cannot be operated until the tagout device is removed.

5. Procedures

5.1. Exposure Survey

5.1.1. The designated Component Person in charge of the activity will conduct a hazardous-energy survey to and develop a Mothed of Procedure to determine affected machines and equipment, types, and magnitude of energy, and necessary service and maintenance tasks. Each task will be evaluated to determine if it must be accomplished with lockout or tagout procedures and also determine if the current hazard is covered under the current Job/Activity Hazard Analysis.

5.2. Energy control procedures

5.2.1. Authorized employees who lockout or tagout equipment or do service and maintenance must follow specific written energy-control procedures. The procedures must include the following information:

5.2.1.1. The intended use of the procedure

5.2.1.2. Steps for shutting down, isolating, blocking, and securing equipment

5.2.1.3. Steps for placing, removing, and transferring lockout devices

5.2.1.4. Equipment-testing requirements to verify the effectiveness of the energy-control procedures

5.2.2. When re-energizing equipment is necessary — when power is needed to test or position the equipment, for example — temporary removal of lockout or tagout devices is allowed. This applies only for the time required to perform the task and the procedure must be documented.

5.2.3. Employees must do the following before they begin service or maintenance work:

5.2.3.1. Inform all affected employees of equipment shutdown.

5.2.3.2. Shut down equipment.

5.2.3.3. Isolate or block hazardous energy.

5.2.3.4. Remove any potential (stored) energy.

5.2.3.5. Lockout or tagout the energy sources.

5.2.3.6. Verify the equipment is isolated from hazardous energy and de-energized.

5.2.4. Employees must do the following if they remove lockout or tagout devices and re-energize equipment:

5.2.4.1. Remove tools and replace machine or equipment components.

5.2.4.2. Inform coworkers about energy-control device removal.

5.2.4.3. Ensure all workers are clear of the work area.

5.2.4.4. Verify machine or equipment power controls are off or in a neutral position.

5.2.4.5. Remove the lockout or tagout device.

5.2.4.6. Re-energize equipment.

5.3. Special lockout/tagout situations

5.3.1. Energized testing

5.3.1.1. When an energy-isolating device is locked or tagged and it is necessary to test or position equipment, do the following:

5.3.1.1.1. Remove unnecessary tools and materials.

5.3.1.1.2. Ensure that all other employees are out of the area.

5.3.1.1.3. Remove locks or tags from energy isolating devices.
5.3.1.1.4. Proceed with test.
5.3.1.1.5. Deenergize equipment and lockout or tagout energy-isolating devices.
5.3.1.1.6. Operate equipment controls to verify that the equipment is de-energized.

5.3.2. Contract service and maintenance

5.3.2.1. BNB Staff and subcontractors must be aware of their respective lockout/tagout procedures before the subcontractor does onsite work requiring Lockout/tagout. BNB Staff and employees must review and comply when applicable with the subcontractor's energy-control procedures if they are more stringent then our own

5.3.3. Group lockout

5.3.3.1. When authorized employees must service equipment that has several energy sources and several energy-isolating devices, the employees must follow group lockout procedures. Contact must be made with each responsible person in charge of the perspective isolated energy and written confirmation of lock out tag out must be obtained.

5.3.4. Shift changes and long-term shutdowns

5.3.4.1. Employees must follow BNB's and the responsible subcontractors' specific written procedures when it is necessary to continue lockout/tagout when work shifts change and during long-term shutdowns. BNB Superintended or the appropriate subcontractor's competent representative is responsible for monitoring lockout and tagout devices that control the energy to equipment during long-term shutdowns

5.4. Lockout and tagout devices

5.4.1. Lockout and tagout devices must meet the following criteria to ensure that they are effective and not removed inadvertently:
5.4.1.1. Lockout devices must work under the environmental conditions in which they are used. Tagout device warnings must remain legible even when they are used in wet, damp, or corrosive conditions.
5.4.1.2. Lockout and tagout devices must be designated by color, shape, or size. Tagout devices must have a standardized print and warning format.
5.4.1.3. Lockout devices and tagout devices must be strong enough that they can't be removed inadvertently. Tagout devices must be attached with a single-use, self-locking material such as a nylon cable tie.
5.4.1.4. Any employee who sees a lockout or tagout device must be able to recognize who attached it and its purpose.
5.4.1.5. Each lock must have a unique key or combination
5.4.2. Energy-isolating devices are the primary means for protecting BNB's employees and subcontractors who service equipment or be exposed to hazardous energies utilizing equipment and must be designed to accept a lockout device. Energy isolating devices must clearly identify function.
5.4.3. *Electrical energy sources*. Lockout or tagout of electrical energy sources must occur at the circuit disconnect switch. Electrical control circuitry does not effectively isolate hazardous energy. See also, Alternative methods.

5.5. Alternative methods

5.5.1. When lockout or tagout is not used for tasks that are routine, repetitive, and integral to the production process, or prohibits the completion of those tasks, then an alternative method must be used to control hazardous energy.
5.5.2. Selection of an alternative control method must be based on a risk assessment of the machine, equipment, or process. The risk assessment must consider existing safeguards provided with the machine, equipment or process that may need to be removed or modified to perform a given task.
5.5.3. For example, when control circuits are used as part of the safeguarding system, the system must be designed to ensure protection as effective as a mechanical disconnect switch or master shutoff valve. A control-reliable dual channel hardwired circuit of industrially rated components that satisfies the design features as specified in ANSI B11.19, with a safety relay or safety PLC to ensure integrity and performance of the safeguarding system, must be used.
5.5.4. Under all circumstances, the individual must have exclusive personal control over the means to maintain the state of the control circuit in a protective mode.

5.6. Training

5.6.1. Employees who may be exposed to hazardous energy will receive training before assignment to ensure that they understand BNB's energy-control policy and have skills to apply, use, and remove energy controls. The training will include the requirements of 1926.417 and the following:
  5.6.1.1. Affected employees will be trained in the purpose and use of energy-control procedures. An affected employee uses equipment that is being serviced under lockout or tagout procedures or works in an area where equipment is being serviced.
  5.6.1.2. Authorized employees will be trained to recognize hazardous energy sources, the type and magnitude of energy in the workplace, the methods and means necessary for isolating and controlling energy, and the means to verify that the energy is controlled. An authorized employee locks out or tags out equipment to do service work. An affected employee becomes an authorized employee when that employee's duties include service or maintenance work on equipment.
5.6.2. Employees whose jobs are in areas where energy-control procedures are used will be trained about the procedures and the prohibition against starting machines that are locked or tagged out.
5.6.3. Employees will be retrained annually to ensure they understand energy-control policy and procedures.
5.6.4. Authorized and affected employees will be retrained whenever their job assignments change, energy-control procedures change, equipment or work processes present new hazards, or when they don't follow energy-control procedures. Current training records will be maintained for each authorized and affected employee including the employee's name and the training date

6. References

FEDOSHA – CFR 1926.417 Lockout and tagging of circuits

Cal/OSHA T8 CC Article 7. Miscellaneous Safe Practices

L&I WAC 296-803 Safety Standard for Lockout/Tagout

7. Attachments

None

Lone Work

1.0 Purpose

1.1. Personnel working alone are at an increased risk due to their isolated location which may decrease the likelihood of rapid detection or prompt treatment of an injury. Lone-working personnel must have and follow a plan to stay in communication with a team member during mobilization and as the task is being accomplished.

2.0 Scope

2.1. Whenever personnel work alone, such as in a confined space or an isolated location, the supervisor must account for each worker by sight or by verbal communication throughout each work-shift at regular intervals appropriate to the job assignment; and, at the end of the job assignment or at the end of the work-shift, whichever occurs first.

2.2. For general work in offices outside of typical working hours, BNB has a lone working policy. The member of staff and their supervisor have to positively agree and engage on the lone working initiative, deciding initially if the activity is actually necessary before permitting the work to be undertaken.

3.0 Responsibility

3.1 Project Management

3.1.1. BNB Management will ensure their personnel are accounted for throughout the course of the work shift. BNB Management must report all situations, incidents or near misses where being alone increased the severity of the situation. The Loss Prevention Department will analyze the information and make changes to company policy where necessary.

3.2 Supervision

3.2.1. Supervisors must assess the hazards of the workplace; talk to the workers about their work and get their input on possible solutions; avoid having a lone worker whenever possible, especially for jobs with a recognized risk; take corrective action to prevent or minimize the potential risks of working alone; provide appropriate training and education; establish a check-in procedure; ensure regular contact is kept with all workers; establish ways to account for people (visually or verbally) while they are working; schedule high-risk tasks to be done during normal business hours, or when another worker is capable of helping when an emergency is present. Supervisors shall ensure rapid assistance to workers in the event of an emergency.

3.3 Workers

3.3.1. Workers must not work alone without effective arrangements in place for locating and rescue should they become incapacitated.

4.0 Definitions

4.1. Alone - A worker is alone at work when they are on their own; when they cannot be seen or heard by another person; and when they cannot expect a visit from another worker.

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

4.3. Confined Space - Is large enough and so configured that an employee can bodily enter and perform assigned work and has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry) and is not designed for continuous employee occupancy.

4.4. Isolated Location - Is an area where employees are working alone or with little assistance from others due to the type, time, or location of their work. Such locations can include remote locations or other work areas where employees are not in close proximity to others.
4.5. High Risk Activities - Working at heights, in confined spaces (such as tanks, grain bins or elevators, culverts, etc.), with electricity, with hazardous substances or materials, with hazardous equipment (such as chainsaws or chop/demo saws), with materials at great pressures, or with the public where there is a potential for violence.
4.6. Qualified Person, Attendant or Operator - A person designated by their employer who by reason of training, experience or instruction has demonstrated the ability to safely perform all assigned duties and, when required, is properly licensed in accordance with federal, state, or local laws and regulations.

5.0 Procedure

5.1 Hazards

5.1.1. Personnel who become injured/ill while working alone could succumb to their injuries/illnesses prior to being discovered. Without direct supervision, lone workers could potentially take shortcuts which could expose them to risk(s) or reduce their quality of work.

5.2 Factors to Consider

5.2.1. Length of time the worker will be alone:

5.2.1.1. What is a reasonable length of time for the worker to be alone?
5.2.1.2. Is it reasonable for the worker to be alone at all?
5.2.1.3. How long will the worker be alone to finish the job?
5.2.1.4. Is it legal for the worker to be alone while doing certain activities? (For example: some jurisdictions may restrict working alone in a confined space, or during lock-out / tag-out operations).
5.2.1.5. What time of the day will the worker be alone?

5.2.2 Communication:

5.2.2.1. What forms of communication are available?
5.2.2.2. Is it necessary to "see" the worker, or is voice communication adequate?
5.2.2.3. Will emergency communication systems work properly in all situations?
5.2.2.4. If the communication systems are located in a vehicle, do you need alternative arrangements to cover the worker when they are away from the vehicle?

5.2.3 Location of the work:

5.2.3.1. Is the work in a remote or isolated location? (Remember that a remote location does not have to be far away. Storage rooms that are rarely used can be considered remote or isolated.)
5.2.3.2. Is transportation necessary to get there? What kind of transportation is needed?
5.2.3.3. Is the vehicle equipped with emergency supplies such as food and drinking water, as well as a first aid kit?
5.2.3.4. Will the worker need to carry some or all of the emergency supplies with them when they leave the vehicle?
5.2.3.5. Does the worker need training to be able to use the first aid equipment?
5.2.3.6. What are the consequences if the vehicle breaks down?
5.2.3.7. Will the worker have to leave the vehicle for long periods of time?

5.2.4 Type or nature of work:

5.2.4.1. Is there adequate training and education provided for the worker to be able to work alone safely?
5.2.4.2. Is there adequate personal protective equipment available? Is it in good working order?
5.2.4.3. What machinery, tools or equipment will be used?
5.2.4.4. Is there a high risk activity involved?
5.2.4.5. Is fatigue likely to be a factor?
5.2.4.6. Are there extremes of temperature?

5.2.4.7. Is there risk of an animal attack, insect bite (poisonous, or allergic reaction), etc.?
5.2.4.8. If the person is working inside a locked building, how will emergency services be able to get in? (For example: a night worker in a secure office building)
5.2.4.9. Does the work involve working with money or other valuables?
5.2.4.10. Does the work involve seizing property or goods (such as repossession, recovering stolen property, etc..)?

5.2.5 Characteristics of the individual who is working alone:

5.2.5.1. Are there any pre-existing medical conditions that may increase the risk?
5.2.5.2. Does the person have adequate levels of experience and training? (For example: first aid, communication systems repair, vehicle breakdowns, relevant administrative procedures, and/or outdoor survival?)

5.3 Check-In Procedures

5.3.1. It is important that a check-in procedure be in place. The supervisor will decide if a verbal check-in is adequate, or if the employee must be accounted for by a visual check. Supervisors must make sure the plan is appropriate for both regular business hours as well as after main office hours.
5.3.2. For most lone workers, a cellphone will be the main source of contact. If a cell phone is unreliable in the area, ensure alternative methods of communication are available (such as use of public telephones, site visits or satellite technology).
5.3.3. The lone worker's supervisor or a family member who has the supervisor's contact information should know the following details regarding their lone worker's travel outside of their normal commute or typical business hours:

5.3.3.1. destination,
5.3.3.2. estimated time of arrival,
5.3.3.3. return time or date,
5.3.3.4. contact information,
5.3.3.5. mode of travel (public transit, car, plane, etc.) and,
5.3.3.6. alternate plans in the event of bad weather, traffic problems, etc.

5.3.4 An example of a check-in procedure is:

5.3.4.1. Prepare a daily work plan so it is known where the lone employee will be and when.
5.3.4.2. Identify one main person to be the contact at the office, plus a backup.
5.3.4.3. Define under what circumstances the lone worker will check in and how often.
5.3.4.4. Stick to the visual check or call-in schedule. You may wish to have a written log of contact.
5.3.4.5. Have the contact person call or visit the lone worker periodically to make sure he or she is okay.
5.3.4.6. Pick out a code word to be used to identify or confirm that help is needed.
5.3.4.7. Begin contacting designated emergency contacts if the lone employee does not check-in when he or she is supposed to.
5.3.4.8. Family members of the lone worker may notify the supervisor or emergency contacts if the lone worker fails to arrive at the expected time.

5.4 Means of Verification

5.4.1. Supervision and/or designated representatives must account for personnel by visual or verbal communication. Acceptable means of visual communication may include video surveillance or in-person visual contact. Acceptable means of verbal communication may include the use of mobile phones, two-way radios (walkie-talkies), in-person talking, or intercom systems.

6.0 References

NHS Lone Working Guidance Section 3.3

L&I WAC 296-800 – Core Safety

FEDOSHA 29 CFR 1915.84 – Lone Work

7.0 Attachments

Confined Space Entry Permit

Demolition Permit

Pre-Task Plan

Material Handling & Rigging

1.0 Purpose

1.1. The purpose of this policy is to provide safe work practices for using equipment for material handling, moving, lifting, and rigging.

2.0 Scope

2.1. This policy applies to material / load handling activities conducted with equipment when using slings, rigging hardware or below-the-hook lifting devices. For additional information, please reference Forklifts and Cranes.

3.0 Responsibility

3.1. Project Management

3.1.1. BNB Project Management & Supervision will ensure that material handling and rigging operations are conducted in a safe manner via proper planning and execution of site logistics. The planning should address the separation of personnel from equipment.

3.2. Workers

3.2.1. Workers are responsible for following proper material handling and rigging practices as required by this policy and their employer's safety program, job/activity hazard analysis, and pre-task plan. Workers are responsible for maintaining separation from equipment during material handling and rigging.

4.0 Definitions

4.1. *Controlled Access Zone (CAZ)* – a delineated area established to restrict access and exposure to hazards such as overhead work, suspended loads, etc.

4.2. *Free Rigging* – the use of a powered industrial truck/forklift to hoist material by using a chain or rigging from the forks. Note: This procedure is prohibited by the manufacturer and is against BNB policy.

4.3. *Tele-handler* – Also called "Rough Terrain" or "Extended Reach" or "Type 7" because of the telescopic boom. These forklifts are similar to cranes in that they extend and elevate loads, often requiring outriggers. Additional discussion, evaluation, and training specific to their hazards and operation is required. Because they are used in rough terrain, and they can telescope the boom, tip overs are more of a concern.

4.4. *Unattended Forklift* – A forklift is unattended if it is left running and the operator is out of the seat. A forklift is also classified as unattended if the forklift is left with the forks suspended is turned off, but the operator is 25 feet or more away.

4.5. *Fall Zone*- Only employees essential to the operation are permitted in the fall zone (but not directly under the load). An employee is essential to the operation if the employee is conducting one of the following operations and the employer can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone: (1) Physically guide the load; (2) closely monitor and give instructions regarding the load's movement; or (3) either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing).

4.6. *Master Link*- A key component of multi-legged wire rope bridle slings, stringers, alloy chain slings and web sling bridles. Maximum included angle of 120 degrees

4.7. *Qualified person*- a person who, by possession of a recognized degree or certificate of professional standing in an applicable field, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work

4.8. *Angle of loading*- the acute angle between the horizontal and the leg of the rigging, often referred to as the horizonal angle

4.9. *Below-the-hook lifting devices (BTHLD's)* – is a tool or mechanical device that attached to a crane or other apparatus and grabs and secures a load so that it can be moved safely from one location to another.

5.0 Procedure

5.1. General

5.1.1. Rigging equipment shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe
5.1.2. Do not attempt to catch falling objects
5.1.3. Tag lines must be used if loads could possibly swing or need to be manipulated by hand unless their use causes a greater hazard, and must be of the non-conductive type
5.1.4. It is prohibited to use tie wire as a tag line.
5.1.5. Wire rope shall not be burned off with heat. Any wire rope with welding damage must be discarded
5.1.6. All loads must be made secure before moving or transporting
5.1.7. Mark special custom-design grabs, hooks, clamps, or other lifting accessories to indicate the safe working loads.
5.1.8. Lifting devices must be rated with limits, and equipment they are attached to (e.g., forklifts) must be designed and approved for those attachments
5.1.9. All rigging equipment will be designed, proof tested and certified with a 5:1 safety factor
5.1.10. Only domestic drop-forged rigging and lifting hardware or hardware that meets the ASME B30.26 standard shall be authorized for use on BNB projects
5.1.11. Rigging Hardware that does not have the certificate of test and examination available to BNB upon request shall not be allowed for use on BNB projects
5.1.12. Wire rope clips are prohibited for the use of rigging on overhead loads
5.1.13. Malleable cast iron wire clips are prohibited on BNB projects
5.1.14. Job-made/custom-fabricated lifting hardware and attachments are prohibited unless designed by a Registered Professional Engineer and BNB is provided with documentation.
5.1.15. Palletized loads should be used with a crane pallet attachment and shall be done in accordance with the manufacturer's recommendations
5.1.16. When workers could be exposed to injury from rigging failures, a pick plan must be developed with a rigging diagram that illustrates capacities of all components the capacities of rigging hardware must be marked on the device, and not exceeded
5.1.17. Rigging hardware must be designed for the application and environment in which it will be used
5.1.18. Rigging equipment, when not in use, shall be removed from the immediate work area to prevent hazards to employees
5.1.19. Never block an aisle or walkway with materials or equipment
5.1.20. Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used, to the extent consistent with public safety
5.1.21. Equipment removed from service must be tagged with an "Out of Service" tag
5.1.22. Load-line fittings are not allowed to contact the rigging block sheave
5.1.23. Wind speed – Wind must not exceed the speed recommended by the manufacture or, where the manufacture does not specify this information, the speed shall be determined by a qualified person

5.1.24. Slings

5.1.24.1. When slings are applied to sharp-edged loads, the sharp edges must be protected with softeners sized appropriately to prevent damage to the slings.
5.1.24.2. All slings must have legible tags. If the tags are no longer legible, slings must be discarded so they cannot be used again.

5.1.24.3. Double wrap choker hitch must be used at a horizontal sling angle less than 45 degrees
5.1.24.4. Double leg basket hitch must not be used at a sling angle less than 60 degrees
5.1.24.5. Sling angles of less than 30 degrees are prohibited

5.1.25. Hooks & Rigging Hardware

5.1.25.1. All hooks shall have functioning safety latches. Hooks and other rigging components shall be attached in a secure manner. Hooks and other lifting attachments on the buckets of front-

end loaders, and backhoes are prohibited from use unless used in accordance with the manufacturer's specifications designed and certified by a professional engineer.

5.1.25.2. All hooks must be loaded in the base of the hook. Tip loading, side loading or back loading hoist hooks is prohibited

5.1.25.3. Slings and rigging hardware shall not exceed a maximum included angle of 90 degrees in hooks

5.1.25.4. Hooks shall be visually inspected prior to use to verify safe working condition. Hooks shall be removed in accordance with the hook manufacturer's specifications, some criteria for removal from service are:

5.1.25.4.1. Evidence of cracks, sharp nicks, or gouges

5.1.25.4.2. Wear exceeding 10 percent in the bowl or five percent on the back of the hook of original dimension

5.1.25.4.3. Any visible apparent bend or twist from the plane of the unbent hook

5.1.25.4.4. Increase in throat opening exceeding 5 percent not exceeding ¼ inch from the manufactures original dimension. See manufactures recommendations

5.1.25.4.5. Missing or improperly functioning safety latch

5.1.25.4.6. Any modification, i.e., grinding or welding.

5.1.25.4.7. The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks.

5.1.25.4.8. All hooks for which no applicable manufacturer's recommendations are available shall not be allowed on BNB job sites for use. The subcontractor shall maintain and keep readily available a certification record which includes the date of such tests, the signature of the person who performed the test and an identifier for the hook which was tested.

5.1.25.4.9. Sub-contractors must ensure that shackles have permanently affixed, and legible identification markings as prescribed by the manufacturer indicating the recommended safe working load for the shackles

5.1.25.4.10. Sub-contractors must provide the manufactures recommendations of all rigging hardware if requested by BNB management.

5.1.26. Chains

5.1.26.1. Only steel alloy chains Grade 8 (80) or 10 (100) shall be used for overhead hoisting procedures

5.1.26.2. Alloy steel chain slings shall have permanently affixed, and legible markings as prescribed by the manufacturer that indicate the recommended safe working load for the type(s) of hitch(es) used, the angle upon which it is based, and the number of legs if more than one

5.1.26.3. A chain sling shall be removed from service if missing or illegible sling identification

5.1.26.4. Makeshift links or fasteners formed from bolts or rods, or other such attachments, shall not be used

5.1.27. Come-Along and Chain falls

5.1.27.1. Come-along and chain falls shall be used as per manufacturer's specifications and legislative jurisdictional requirements. When chain falls are used as a rigging component with a mobile crane, the lifts shall be deemed as a critical lift.

5.1.27.2. Come-along and chain falls shall:

5.1.27.2.1. Follow ASME B30.16 and ASME B30.21 standards

5.1.27.2.2. Be inspected for internal/external wear and be proof tested prior to use and every 12 months thereafter.

5.1.27.2.3. Have the capacity identified, manufacturer name and manufacture's model or serial number

5.1.27.2.4. Ensure that a straight line is maintained "hook to hook

5.1.27.2.5. Ensure that hooks are not engaged into the edge of a steel plate or beam flange which results in tip loading

5.1.27.2.6. Have all components, including the hook, rated in consideration of the required safety factors, of a sufficient capacity for the hoist.

5.1.27.2.7. Not have the chain or wire cable wrapped around the load for hoisting or routed around corners and:

5.1.27.2.8. Have load limiters, if so equipped, set at or below the safe working load

5.1.27.3. Come-along and chain falls shall be removed from service if there is:
5.1.27.3.1. Any evidence of slipping or failure.
5.1.27.3.2. Any evidence of cracks, damage or other defects on the body or handles.
5.1.27.3.3. Excessive wear, stretch or deformity in the chain, or wire cable
5.1.27.3.4. A direction or recall from the manufacturer.
5.1.27.3.5. Missing or illegible tag

5.1.28. Inspection and Testing of Rigging Components

5.1.28.1. Rigging components shall have a documented inspection prior to initial use on the project and defective rigging shall be tagged and removed from service.
5.1.28.2. Proof test all below-the-hook rigging devices prior to initial use to 125 percent of their rated load.
5.1.28.3. Daily inspections must be performed on all rigging and material handling equipment by a qualified person. See attached Daily Rigging Inspection Checklist.
5.1.28.4. Inspections of alloy steel chains slings shall be performed by a qualified person by the employer, and shall include a thorough inspection for wear, defective welds, deformation and increase in the link length

5.1.29. Multiple Load Lifts & Hoisting Procedures

5.1.29.1. A multiple lift is only to be performed if the following criteria are met:
5.1.29.1.1. All rigging components attached to the main hook shall not exceed the 45-degree markings on the main hook or shall follow manufactures recommendations
5.1.29.1.2. Master Links must meet or exceed all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements.
5.1.29.1.3. Master Links – Maximum included angle of 120 degrees
5.1.29.1.4. Multiple load lifts will only be conducted on like or similar items
5.1.29.1.5. A maximum of three separate loads may only be rigged per lift
5.1.29.1.6. The multiple lift rigging device has a capacity based on the manufacturer's specifications with a five to one safety factor for all components.
5.1.29.1.7. A site-specific multiple load lift hoisting plan shall be developed by a qualified person, approved by the Superintendent of the sub-contractor performing the lift and reviewed by BNB Management, prior to hoisting procedures.
5.1.29.1.8. The site-specific multiple load lift hoisting plan must ensure that all crew members involved have been trained and signed off by the competent person (foreman)
5.1.29.1.9. The site-specific multiple load lift hoisting plan shall be designed to ensure that all requirements of the local state and federal are met to include more specifically FED-OSHA 1926 Subpart CC and WAC 296-155, or CAL-OSHA Article 15
5.1.29.1.10. Only hooks with self-closing safety latches or the equivalent shall be used for multiple load lift hoisting.
5.1.29.1.11. Multiple load lifts shall be rigged reasonably level and shall prevent hazardous contact between the loads
5.1.29.1.12. Hoisting devices (BTHLD's) are prohibited unless used in accordance with the manufacture's specifications to include being designed and certified by a professional engineer.
5.1.29.1.13. BTHLD's must meet the requirements of the ASME B30.20 / ASME BTH-1 regulations and standards.

5.2. Hazard Controls

5.2.1. Engineering Controls

5.2.1.1. Cargo protection nets:
5.2.1.1.1. Help protect from falling materials
5.2.1.1.2. Fast, simple installation
5.2.1.1.3. Durable net withstands harsh work environments
5.2.1.1.4. Lightweight build maximizes lift capacity
5.2.1.1.5. Crane pallet attachment:
5.2.1.1.6. Automatically levels load
5.2.1.1.7. Telescopic vertical riser and adjustable sliding forks
5.2.1.1.8. Light weight frame maximizes lift capacity

5.2.2. Administrative Controls

5.2.2.1. Material handling must not be conducted overhead of personnel or the public. A Controlled Access Zone (CAZ) must be established to restrict access.
5.2.2.2. Occupied buildings must be vacated if there is a potential for suspended loads to be dropped.
5.2.2.3. Horns, whistles, or other audible warnings should be sounded to warn personnel when loads are to be moved overhead.
5.2.2.4. Rigging – Crane Pick Plans:
5.2.2.4.1. Rigging components to be used must be addressed in all Crane Pick Plans and must include a diagram of the rigging design along with a description of the rigging components including sizes, capacities, angles, and load weights. See Cranes.

5.2.3. Personal Protective Equipment

5.2.3.1. High-visibility vests and hard hats are required when working around moving equipment. Additional personal protective equipment may be safety glasses, protective gloves, work boots, fall protection equipment, etc.

5.3. Training

5.3.1. Personnel engaged in rigging loads must be certified and trained accordingly. Personnel who perform multiple-lift rigging must be provided training on the specific hazards of multiple lifts, the procedures, and equipment. Equipment operators must be trained on the specific piece of equipment, its limitations, and appropriate attachments.

5.4. Load Weights Calculation Assistance Chart

Load Weights - Calculating

(6)

Materials and Liquids - Pounds / cu. ft.			
Aluminum	165	Iron Casting	450
Asbestos	153	Lead	708
Asphalt	81	Lumber - Fir	32
Brass	524	Lumber - Oak	62
Brick	120	Lumber - RR Ties	50
Bronze	534	Oil, Motor	58
Coal	56	Paper	58
Concrete, Reinf.	150	Portland Cement	94
Crushed Rock	95	River Sand	120
Diesel	52	Rubber	94
Dry Earth, Loose	75	Steel	480
Gasoline	45	Water	63
Glass	162	Zinc	437

Pounds / sq. ft.	
Steel plate	
• 1/8"	5
• 1/4"	10
• 1/2"	20
• 1"	40
Aluminum plate	
• 1/8"	1.75
• 1/4"	3.50
Lumber	
• 3/4" Fir	2
• 3/4" Oak	4

Pounds / gal.	
Gas	6.0
Diesel	7.0
Water	8.3

• 7.5 gallons of liquid to a cubic foot
• 27 cubic feet to a cubic yard
• 2,000 lbs = 1 U.S. ton

Formulas and Information

• H = Height • W = Width • L = Length • d = diameter • r = 1/2 diameter • π = 3.2 (approx.)
• Area of square or rectangle = LW • Vol. of cube = HWL • Area of circle = πr^2 • Circumference = π d
• The area of a circle is approx. 80% of its diameter squared (diameter x diameter)
• Load Weight (to estimate) ___ Volume in cu. ft. x 500 lbs. x density factor .02, .05, .10, .20, .30 etc.

6.0 References

FED / OSHA 29 CFR 1926.251 – Material Handling & Rigging

FED/ OSHA 29 CFR 1926.1400 Subpart CC – Cranes and Derricks

CALOSHA Ergonomic Guidelines for Manual Material Handling

L&I WAC 296-800 – Core Safety

L&I WAC 296-24-21501 to 296-24-29431 – Material Handling and Storage

ASME B30.9-Slings

ASME B30.10-Hooks

ASME 30.26-Rigging Hardware

7.0 Attachments

Rigging Inspection Checklist

Mission Critical Protocol

Projects Working Under Pandemic Conditions

Project Name/Number/Date "Here"

Shift	Start Time	End Time
XXXX		
XXXX		

1.0 Purpose

1.1. The following is a supplemental guide to BNBuilders pandemic protocol and the project risk assessment form. This supplemental guide addresses the steps and procedures this project will be implementing in order to keep the project open as the project has been deemed mission critical by the client.
1.2. First and foremost, we want to maintain a safe and healthful workplace and encourage and/or adopt practices protecting the health of employees, customers, visitors and others. We also want to ensure the continuity of business operations for these mission critical projects where it is reasonable to do so.
1.3. The following outlines the steps and procedures we are proposing for each person interacting with the project site.

2.0 Questions & References

2.1. Questions regarding this protocol should be directed to the following:
2.2. Safety Director Leary Jones Leary.Jones@bnbuilders.com
2.3. Human Resource Director Prema Krishnan Prema.Krishnan@bnbuilders.com
2.4. The following protocol has utilized the following references materials which we encourage you to review.

3.0 Responsibility

3.1 Management

3.1.1. BNB Management will ensure that adequate pre-planning is conducted to address infection control for all project sites. Owners, consultants, and subcontract partners will be notified by BNB Management in the event of a potential and/or actual exposure. Management shall ensure that all staff and visitors are aware of this policy.

3.2 Supervision

3.2.1. Supervision shall be responsible for maintaining and enacting the steps and procedures outline herein. Supervision shall also perform daily worker control checks to ensure workers are adhering to the limits addressed within this protocol.

3.2.2. Control checks shall be done twice per shift or in greater frequency as determined by the Supervisor and Safety team. Supervision shall implement safety plans by following current BNB safety procedures. A project "Shut Down" checklist shall be completed prior to projects shutting down for Government mandated or potential COVID related exposures. Likewise, a project "Start Up" checklist shall be completed prior to a project starting back up. The assigned safety professional will review and approve above mentioned checklists prior to project shut down or start up. In the event of a project

shut down related to a COVID exposure, the assigned safety professional will complete the "Jobsite Reopening Risk Assessment for Exposure Shutdown" form prior to reopening.

3.2.3. Project COVID Leadership Team - Identify a team to address COVID related items that may affect the implementation of this plan. This team will meet daily to discuss the following:

3.2.3.1. Most recent COVID related updates
3.2.3.2. Plan implementation
3.2.3.3. Mission Critical Protocol
3.2.3.4. Site Logistics
3.2.3.5. Emergency Response
3.2.3.6. Plan will be modified as needed

3.2.4. A site-specific COVID-19 Supervisor shall be designated by the project specific COVID Leadership Team at every jobsite to monitor the health of employees and enforce the COVID-19 jobsite safety plan. A designated COVID-19 Supervisor must be present at all shifts and at all times during construction activities. AGC has issued guidelines clarifying expectations click here for document.

"Insert Team Members Here"

3.3 Personnel & Workers

3.3.1. Personnel and workers are required to sign in **daily** and to follow the rules and procedures as indicated within this plan. All personnel and workers shall also maintain vigilance and care while onsite to limit exposure opportunities. Personnel and workers shall be provided an additional 5 minutes to wash their hands prior to beginning work breaks and lunches. Any personnel and workers who are classified as high risk category per CDC guidelines are highly encouraged to NOT be at the jobsite. The higher risk list includes people 65 years and older, people with underlying medical conditions, and people who are pregnant. Any personnel or worker who meets the high or medium risk exposure guidelines as identified in Section 10 are NOT allowed on site under this protocol until approved by management, these individuals shall notify management 2 business days prior to site access. Workers shall also monitor and report any potential COVID-19 and or flu like symptoms, if this occurs, they are NOT to report to the site

3.3.2. Symptoms for COVID - 19:
3.3.2.1. Cough
3.3.2.2. Fever
3.3.2.3. Shortness of Breath

3.3.3. See complete list of symptoms here https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html
3.3.4. See the complete high-risk list from the CDC here https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/high-risk-complications.html

3.4 Subcontractors

3.4.1. Subcontractors shall follow the guidelines in accordance with CDC, State, and Local regulatory agencies, to include but, not limited to BNB pandemic protocol. Prior to the start of work, subcontractors shall submit their COVID 19 protocol to BNB for review. In the event the subcontractor does not have a pandemic protocol, said subcontractor shall comply with BNB's protocol.

3.5 Visitors

3.5.1. Visitors shall be limited to only those that are critical to the completion of schedule critical work. Project teams shall work to utilize FaceTime and or videos to provide condition assessment to those who require status of the work.

4.0 Site Management and Work Plans

4.1 Starting the work shift and Checking in.

4.1.1. All persons who have interaction with the site must pass through designated entrance points which include the STOP and check symptom notices issued by BNBuilders. Sites with multiple entrances must be managed BNBuilders in conjunction with other GC's, if applicable.

4.1.1.1. Once staff and visitors pass the STOP and check entrance points all persons interacting with the site must check in and answer the symptoms and travel questions at check-in. Nonparticipation in these steps shall require immediate dismissal from the site. Where applicable, check in questions may include but are not limited to:

4.1.1.1.1. Are you coming to work from any state that is not neighboring to WA? (If "Yes" must self-quarantine for 14 days to become eligible to work on a jobsite in WA)

4.1.1.1.2. Do you have a fever (100.4°F or higher), cough, shortness of breath or difficulty breathing, chills, repeated shaking with chills, muscle pain, headache, sore throat, or new loss of taste or smell? (If "Yes", leave workplace, report to supervisor and contact your medical provider)

4.1.1.1.3. Note: Pens will not be shared during sign in process. If QR reader does not work a designated BNB representative will sign in for craft personnel.

4.1.1.2. If any person who is found to not be properly self-reporting at the site check-in shall be immediately removed from the site. In addition, the person's direct supervisor shall also be removed from the site. If this person is considered medium to high risk or showing any symptoms, the project shall be shut down and cleaned according to BNBuilders pandemic protocol. Known violators of this will be responsible for all cleaning and shut-down associated costs.'

4.1.1.3. Check-in and site access times should be staggered in order to reduce groups and close contact with others.

4.1.1.4. Project shall utilize the BNB sign in app or a paper sign in sheet with sanitized pens when available for use in lieu of sign in app.

4.1.1.5. If elected by the project specific COVID Leadership Team or when required by Federal, State, or local guidelines, BNBuilders will conduct active screening (thermal temperature checks) at building/project points of entry. Personnel displaying temperatures above 100.4 will be sent home, project team notified, and information will be documented.

4.1.1.5.1. The temperature screening applies to anyone who wants to enter our projects and offices (100% Screening).

4.1.1.5.2. Temperature screening will be completed at the beginning of each shift.

4.1.1.5.3. Anyone who refuses to be screened will be denied entry.

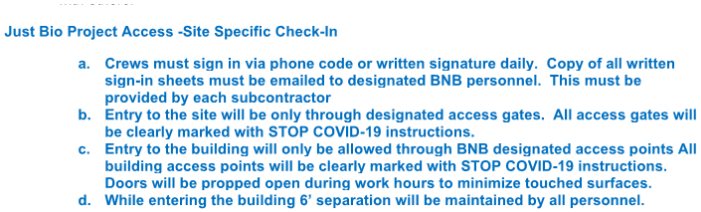
4.1.1.5.4. Projects with multiple entries will have temperature screening stations at each entry point.

4.1.1.5.5. See BNB COVID-19 Temperature Scanning Guide here.

4.1.2. Best Practice: Place workers in small controlled groups to maintain contact circles. A.k.a Family Groups!

Insert Site Specific Information "Here"

Example:



Just Bio Project Access -Site Specific Check-In

a. Crews must sign in via phone code or written signature daily. Copy of all written sign-in sheets must be emailed to designated BNB personnel. This must be provided by each subcontractor
b. Entry to the site will be only through designated access gates. All access gates will be clearly marked with STOP COVID-19 instructions.
c. Entry to the building will only be allowed through BNB designated access points All building access points will be clearly marked with STOP COVID-19 instructions. Doors will be propped open during work hours to minimize touched surfaces.
d. While entering the building 6' separation will be maintained by all personnel.

4.2 Site Specific Communication/Logistics Plan

4.2.1. All projects are required to establish routing plans for entering and exiting site and break areas.
4.2.2. Identify on a plan where hygiene stations and break areas are located.
4.2.3. Designate where signs are located and maintained to communicate emphasis on social distancing in each area.
4.2.4. Establish a zoning plan that designates work areas, as applicable.
4.2.5. Designate a team lead to monitor the work that falls in the specified work area.
4.2.6. Update PTP to reflect the logistics of work area, including social distancing and ensure team lead has knowledge of days plan.
4.2.7. Review and sign off on all pre task planning on a daily basis,
4.2.8. Ensure employees, craft and sub-contractors are not taking breaks, eating/buying lunch, or traversing through active owner occupied facilities.
4.2.9. The following documents are required to be posted in a location accessible by all personnel: The below documents will be accessible via link to (SharePoint).
4.2.10. Mission Critical Protocol Rev 6
4.2.11. COVID-19 Site-Specific Supervisor
4.2.12. COVID- 19 Mission Statement
4.2.13. Cal/OSHA COVID-19 Infection Prevention in Construction Guidance (CA Only)
4.2.14. COVID – 19 Jobsite Practices
4.2.15. BNB COVID-19 Temperature Scanning Guide (if Applicable)
4.2.16. COVID-19 Toolbox Talk Revised – 04-23-2020
4.2.17. Phase 2 Construction COVID 19 Safety Requirements Final (WA Only)
4.2.18. 20-25 Addendum Implementation of Phase 1 Construction Restart Proclamation (WA Only)

"Insert Site Specific Information HERE"

4.3 Crew counts shall be addressed per the following;

4.3.1. If the area of work is supporting multiple shifts, then see additional cleaning measures identified in section 8.0
4.3.2. Delivery personnel shall not be included in the staff counts assuming the delivery driver does not leave their delivery vehicle. If deliveries are requiring assistance from the driver or carrier then that person must be checked in and respond to the symptom's questions outline in section 4.1.
4.3.3. Work to maintain designated employees are assigned to each work area.
4.3.4. In an effort to reduce cross contamination site workers will be encouraged to not work multiple sites each day.
4.3.5. Staff and crew counts will be based on the projects ability to maintain social distancing guidelines of 6'. If social distancing cannot be accomplished, crew counts will need to be reduced or additional PPE protocols will need to be followed
4.3.6. For Jobsites working in the State of Washington:

4.3.6.1. Crew counts associated with the area of work shall not exceed 50 persons per shift. The area of work shall be defined as the project's site boundaries and shall include any areas that function

as support for the area of work (such as; loading docks, offices, restrooms, entry areas, and other critical areas).

4.3.6.2. If the area of work allows separation, such as within another building, then the area of work shall be supported by no more than 50 persons within each area of work. Solid and definable separation shall be in place clearly delineating the separated work areas. Each area of work shall have its own break area(s), entrance, and restrooms. In no way shall staff intermix between the separated areas.

4.3.6.3. The 50-person limit is a guideline and each project should monitor work areas and adjust based on maintaining social distancing.

"Insert Site Specific Information HERE"

4.4 Crew Interactions shall be addressed per the following;

4.4.1. Workers shall maintain at least six feet (6' 0") of social distance separation at all times. This shall include not only during direct work activities but also during breaks, check-ins and person to person communication events, such as job walks, inspections, client visits, etc..

4.4.2. When a task requires workers to work within 6' of each other, it must be address in their PTP steps taken to reduce exposure as much as possible. (WA Requirement) Employees working within 6' for more than 10 minutes multiple times per hour shall wear N95 or KN 95.

4.4.3. Break rooms shall be reviewed, with chairs and or tables removed and rearranged, to ensure social distancing measures are in place. Additional break areas may be required.

4.4.4. When taking direction from or communicating with other personnel social distancing shall always be maintained unless it is an emergency.

4.4.5. All choke points such as hallways, doorways, entry points, hand wash stations, bathrooms, elevators, manlifts, mobile food service, etc. are considered high risk areas and social distancing shall be practiced.

4.4.6. Personnel involved operating and disinfecting man-hoists/elevators shall wear a N95/KN95 mask and nitrile gloves.

4.4.7. Best Practice:

4.4.7.1. Highlight markers on the ground and/or signage, etc.

4.4.7.2. When negative air machine placed in elevators a minimum of 3-foot social distance must be maintained.

4.4.7.3. Negative air machines in office trailers

"Insert Site Specific Information HERE"

5.0 Prevention and Testing

5.1 In order to prevent and limit the potential exposure all staff shall adhere to the following;

5.1.1. Determine if your work can be done offsite - is the task critical to be done at the project site? Staff and employees shall make all accommodations necessary to limit site staff. We are encouraging everyone to work from home.

5.1.2. Regular health checks should be performed at home to monitor temperature and overall wellness each day. BNBuilders may elect to perform health checks on arrival each day for anyone entering the work area. The implementation of onsite health checks will depend on a risk assessment by our Safety team.

5.1.3. Work or communication that can be addressed over the phone or video conference, including staff within adjoining offices, should be done so.

"Insert Site Specific Information HERE"

6.0 Notification Procedures

6.1 Investigation

6.1.1. In the event a site worker reports testing positive for or coming into close contact with a person having COVID – 19, the following protocol shall be followed:

6.1.1.1. Employees shall immediately notify their supervisor, BNB COVID project leadership team and assigned safety professional.

6.1.1.2. The Safety Professional assigned to the project will initiate the COVID-19 investigation here:

6.1.1.2.1. Confirm who the worker is and which company they work for

6.1.1.2.2. Date of notification

6.1.1.2.3. Identify who was within close contact of affected worker, for example:

6.1.1.2.3.1. Who did they eat lunch with?

6.1.1.3. The assigned safety professional and the project team shall contact the BNB Crisis Management Team.

6.1.1.3.1. Which crew did they work with?

6.1.1.3.2. Identify carpool companions?

6.1.1.4. If positive test identified on a project, no employees shall be transferred to another project until contract tracing is complete.

6.2 COVID-19 Reporting Protocol

6.2.1 Project Exposure Related Testing

6.2.1.1. In the event of any COVID-19 related exposure on any project or BNB office, the Safety Department must be notified. Upon completion of the COVID-19 investigation, notification to the Crisis Management Team (CMT) must be sent out immediately highlighting the specifics of the case. The CMT will confirm direction on the handling of each case to ensure documentation is being followed.

6.2.2 Crisis Management Team Members:

6.2.2.1. Leary Jones, Jason Limp, Jim Charpentier, Prima Krishnan, Brad Bastian, Casey Blake

6.2.3 Notification Process

6.2.3.1. A group email (members below) has been set up titled **"**COVID-19 Exposure Reporting**".** Please send all correspondence to this email group.**:** Leary Jones, Prema Krishnan, Jason Limp, Casey Blake, Regional Safety Manager, Savanna Anderson

6.2.4 Reporting and follow-up

6.2.4.1. Assigned Safety Professional and the Project level COVID 19 Leadership Team (CLT) will initiate an investigation to capture all applicable information related to the reported COVID exposure.

6.2.4.2. In the event there was a potential exposure, the team should immediately start contact tracing through our sign in app, interview of affected worker and Pre-Task planning signatures, in preparation for additional notifications, if needed.

6.2.4.3. Create an email with a description of the event without naming the employee(s) in question.

6.2.4.4. Send email to: **"**COVID-19 Exposure Reporting**"**

6.2.4.5. The safety team member and the project team CMT will review the information and request a Teams conference call be set up to review the case.

6.2.4.6. The CMT will look at each case and determine if the case is low, medium, or high risk. Quarantine of individual or multiple personnel may be required.

6.2.4.7. Notification Required for the following:
- 6.2.4.7.1. Potential exposure at job site due to reported COVID test.
- 6.2.4.7.2. Potential exposure to job site due to reported symptoms.
- 6.2.4.7.3. Reported exposure to a secondary contact of a COVID positive case.
- 6.2.4.7.4. Job site team member reported being tested for COVID with results pending.
- 6.2.4.7.5. Confirmed "yes" to sign in app pre-screening question(s).
- 6.2.4.7.6. Being informed BNB employee has been out of state other than Idaho or Oregon (WA only).

6.2.5 Roles and Responsibilities

- 6.2.5.1. Leary Jones- project protocols, documentation and follow up to close out. Weekly MCP meeting for follow-up activities.
- 6.2.5.2. Casey Blake- identify low, Medium, or high risk and recommendation if Quarantine is necessary. Weekly CMT meeting.
- 6.2.5.3. Prema Krishnan-Notification process and confidentiality. Review new recommendations and procedures to protect employees' confidentiality.
- 6.2.5.4. Jason Limp- Confirmation steps are in place consistently and reporting to additional CMT members.
- 6.2.5.5. Regional Safety Managers- follow up procedures and close out is documented.
- 6.2.5.6. Safety Team- Responsible for initiating COVID-19 investigations.
- 6.2.5.7. Project COVID Leadership Team (CLT) - follow up with close out and new activities related to the specific cases.
- 6.2.5.8. Savanna Anderson- document on the COVID tracking log
- 6.2.5.9. Note: Before decision is final, the members of the CMT will acknowledge that there is an agreement of the plan to address the COVID report moving forward.

7.0 Personnel Protective Equipment (PPE) & Controls

7.1. ALL EMPLOYEES (INCLUDING SUBCONTRACTORS) ARE REQUIRED TO WEAR FACE COVERING AT ALL TIMES. THIS INCLUDES BUT IS NOT LIMITED TO PROJECTS, PROJECT OFFICES, REGIONAL OFFICES, LOADING AREAS, GRIZZLY ETC..

7.2. Guidance provided for the San Diego Region: Face Coverings Memorandum clarifying facial covering requirement.
https://files.constantcontact.com/b08df757101/cae7936f-e82a-4752-957b-ff3ba0cdc5ca.pdf

7.1 PPE usage under non-close contact shall be as follows;

7.1.1. Local state and federal guidelines in concert with BNBuilders Freedom from Danger shall be utilized to address PPE.

7.1.2. Employees shall not share PPE. This is extended to include radio's, phones, and general hand tools.

7.2 Respirator and facial covering usage for ALL BNB employees and Trade Partners shall be as follows:

7.2.1. WISHA PPE standards (WAC 296-155-200) or CAL/OSHA PPE Title 8 Sub Chp 7 Grp. 2 Art. 10 shall be utilized where applicable. In addition to the framework provided in section WAC 296-823 (bloodborne pathogen) or Cal/OSHA Blood Borne Pathogens Title 8 Sub. Chap. 7 Grp. 16 Art.109 (bloodborne pathogen). According to guidance documents provided by OSHA, and other Regulatory Agencies, BNB is classified as a low-risk industry. BNB leadership has decided that ALL BNB employees shall and will be required to wear a means of face protection while performing any work. Due to extreme demand of N95 respirators during the COVID-19 pandemic, BNB will recognize the CDC exception that permits the use of bandanas and face shields, provided through the link below. BNB site management will ensure an adequate amount of PPE is procured and supplied for BNB employees.

7.2.2. WAC 296-155-200 and CAL/OSHA PPE Title 8 Sub. Chap. 7 Grp. 2 Art.10 (PPE) direct the use of gloves, eye and face protection, including respiratory protection per their jurisdiction.

7.2.3. Note, per the CDC guidelines, alternative products such as: bandana, scarf, fabric facemask may be used. https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html

7.2.4. All subcontractors on site are required to update their PPE assessment to determine appropriate protection for their employees when working within the 6-ft social distancing buffer zone of another employee. This must be provided to BNB and approved by the superintendent and site safety manager prior to authorizing any work that includes two employees within 6-ft of each other. Regardless of work within the 6' Social Distance, ALL Subcontractors are required to wear a facial covering as recommended by the CDC.

7.2.5. Note, recent changes to CDC recommendations regarding the use of face coverings are addressed in the link. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html

7.2.6. How to wear and maintain cloth face coverings:

7.2.7. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html

"Insert Site Specific Information HERE"

7.3 Engineered Controls

7.3.1. Whenever possible the project shall either install and or address the following engineered controls in their risk mitigation plan;

7.3.1.1. Increasing ventilation rates in the work environment

7.3.1.2. Utilizing negative pressure ventilation machines with HEPA filters in confined settings to reduce respirable droplets generating procedures

7.3.1.3. Installing high efficiency air filters

7.3.2. Additional personal hygiene and common contamination points should be addressed and provided as follows:

7.3.2.1. Facial tissues and alcohol wipes for craft use.

7.3.2.2. No touch or open trash cans at hand washing stations and breakrooms.

7.3.2.3. Hand soap at hand wash stations readily available.

7.3.2.4. Hand Sanitizers shall include at least 60 percent alcohol solution.

7.3.2.5. Disposable towels for crew use at breakrooms and hand wash stations.

7.3.2.6. Eliminate shared beverages and snacks. Personnel should be bringing their own coffee, food, and drinks to the site.

7.3.2.7. Site drinking water should utilize individual bottles in lieu of shared water coolers.

7.4 Administrative Controls

1. The following administrative controls shall be addressed by the project site, in conjunction with our pandemic protocol and freedom from danger.
    a. Site safety notices posted onsite addressing the potential of COVID-19.
    b. The following reminders are to be addressed daily;
        i. Reminders to personnel about protocols in place.
        ii. Remind personnel daily to remain at home if any symptoms occur.
        iii. Provide personnel with daily reminders, and any updated training, on COVID-19 risk factors and protective barriers (e.g. cough etiquette and care of PPE).
    c. Provide training for personnel on the changes in PPE protocol, especially for those personnel performing task that such PPE was not previously necessary. Such as cleaning laborers.
    d. Encourage alternating days or additional shifts to limit numbers of onsite personnel.

"Insert Site Specific Information HERE"

8.0 Site Cleaning

1.1. Project leadership is responsible for determining the resources necessary to implement the cleaning protocols outlined below. The project leadership team must identify members of the crew as a dedicated cleaning crew. It is recommended that projects supplement BNB cleaning personnel with professional cleaning services for break areas, restrooms, and high-touch areas to ensure thorough disinfection. BNB employees will be trained on cleaning protocols that includes a list of high-touch areas, PPE and directions for proper application of the project's chosen cleaning agents.

8.1 Cleaning and disinfect of high touched surface areas shall be as follows;

8.1.1. Ensure SDS are reviewed and manufacturer recommendations are being followed in accordance with WAC 296-901 or CAL/OSHA Title 8, Sub Chpt 7, Gp. 16, Art. 109 Hazard Communications
8.1.2. Normal daily cleanup protocols should be followed as outlined by the project team.
8.1.3. At the end of each shift and prior to any shutdown or restart, common areas such as doors and knobs, elevator buttons, job boxes, handrails, conference tables, chairs, light switches, plan tables, shared hand and power tools, battery charging stations, restrooms, and other shared common areas shall be wiped down.
8.1.4. Laborers associated with cleanup of materials, work areas, and shared areas shall adhere to WAC 296-155-200 (PPE) or CAL/OSHA Title 8, Sub Chpt 7, Gp. 16, Art. 109 Hazard Communications during their work activity.
8.1.5. Hand wash stations shall be placed in a reasonable frequency to encourage their use. This may require multiple stations per floor, work zone, or site area. They should be setup in areas where personnel are encouraged to use them frequently. They should be near areas where personnel are handling materials, shared tool usage, or equipment that other workers are handling.
8.1.6. All tools used must be properly cleaned and disinfected by the user of the tool. Each BNB gang box on site must include a box of disinfectant wipes for this purpose. Tools must not be shared between individuals unless they have been properly disinfected.
8.1.7. Personnel involved in disinfecting and cleaning of highly touched areas shall wear a N95/KN95 mask and nitrile gloves.

"Insert Site Specific Information HERE

8.2 Cleaning and disinfecting of shared areas such as breakrooms and bathrooms shall be as follows:

8.2.1. All surfaces routinely touched should be wiped down and cleaned at the end of every scheduled break and or lunch session.
8.2.2. Restrooms must be disinfected at the beginning and end of each shift at a minimum.
8.2.3. Bathrooms and areas for handwashing shall be inspected each shift and appropriately stocked. Shift work shall not continue if hand washing facilities are closed and or not properly stocked.
8.2.4. Subcontractors will be required to disinfect their own break areas in accordance with these procedures.

"Insert Site Specific Information HERE"

8.3 Split Shift Cleaning;

8.3.1. In the event the project is operating on split shift to limit crew sizes, the project shall institute a one-hour separation between shifts. During this time all shared areas shall be re-cleaned and wiped down.

8.3.2. Cleanings agents shall meet the following EPA guidelines
8.3.2.1. https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2

"Insert Site Specific Information HERE"

9.0 Signage and Posting

9.1 Additional signage and posting shall be installed throughout the project work area and offices. The following is a minimum, each project should review and provide signage as required. Signage shall be in multiple languages as required by crew make-up.

9.1.1. Symptom STOP sign at entry
9.1.2. Hand washing signage at all bathroom and handwash stations
9.1.3. COVID-19 protocols in place reminder signage.
9.1.4. Reminder Signage for 6' Social Distancing

"Insert Site Specific Information HERE"

10.0 Exposure Categories

10.1 Exposure Risk Categories for COVID-19

10.1.1. These categories should be considered interim and subject to change:

10.1.1.1. The CDC has established the following exposure risk categories to help guide optimal public health management of people following potential SARS-CoV-2 exposure. These categories may not cover all potential exposure scenarios and should not replace an individual assessment of risk for the purpose of clinical decision making or individualized public health management. Any public health decisions that place restrictions on a person's or group's movements or impose specific monitoring requirements should be based on an assessment of risk for the person or group.
10.1.1.2. These risk levels apply to travel associated and community settings. CDC has provided separate guidance for healthcare settings.
10.1.1.3. All exposures apply to the 14 days prior to assessment and recommendations apply until 14 days after the exposure event.

10.1.2 High Risk

10.1.2.1. Living in the same household as, being an intimate partner of, or providing care in a nonhealthcare setting (such as a home) for a person with symptomatic laboratory-confirmed COVID-19 infection ***without using recommended precautions*** for home care and home isolation
10.1.2.1.1. The same risk assessment applies for the above-listed exposures to a person diagnosed clinically with COVID-19 infection outside of the United States who did not have laboratory testing.
10.1.2.2. Recent travel from a Level 3 country

10.1.3 Medium Risk

10.1.3.1. Close contact with a person with symptomatic laboratory-confirmed COVID-19 infection, and not having any exposures that meet a high-risk definition.

10.1.3.1.1. The same risk assessment applies for close contact with a person diagnosed clinically with COVID-19 infection outside of the United States who did not have laboratory testing.

10.1.3.1.2. On an aircraft, being seated within 6 feet (two meters) of a traveler with symptomatic laboratory-confirmed COVID-19 infection; this distance correlates approximately with 2 seats in each direction.

10.1.3.2. Living in the same household as, an intimate partner of, or caring for a person in a nonhealthcare setting (such as a home) to a person with symptomatic laboratory-confirmed COVID-19 infection ***while consistently using recommended precautions*** for home care and home isolation

10.1.3.3. Travel from mainland China outside Hubei Province AND not having any exposures that meet a high-risk definition

10.1.4 Low Risk

10.1.4.1. Being in the same indoor environment (e.g., a classroom, a hospital waiting room) as a person with symptomatic laboratory-confirmed COVID-19 for a prolonged period of time but not meeting the definition of close contact

10.1.4.2. On an aircraft, being seated within two rows of a traveler with symptomatic laboratory-confirmed COVID-19 but not within 6 feet (2 meters) (AND not having any exposures that meet a medium- or a high-risk definition).

10.1.5 No Identifiable Risk

10.1.5.1. Interactions with a person with symptomatic laboratory-confirmed COVID-19 infection that do not meet any of the high-, medium- or low-risk conditions above, such as walking by the person or being briefly in the same room.

11.0 Disciplinary procedures

11.1. Workers who intentionally provide false information on the sign in app or fail to follow BNB pandemic protocols will be permanently removed from the project and/or terminated from employment (BNB Personnel). Subcontractors may be placed on notice and/or subjected to back charges when violating BNB Pandemic Protocols.

12.0 References

12.1. The plan and procedures noted above are done in partnership with the referenced information identified below. The information utilized is as of March 17, 2020

CDC Disease 2019 (COVID-19)

https://www.cdc.gov/coronavirus/2019-ncov/prepare/prevention.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fabout%2Fprevention.html

CDC Disease 2019 – Schools, workplaces & Community Locations

https://www.cdc.gov/coronavirus/2019-ncov/community/index.html

Unites States Department of Labor OSHA COVID-19

https://www.osha.gov/SLTC/covid-19/standards.html

CDC Respiratory Protection Alternatives

https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html

CDC Clean and Disinfect for Household with Suspected Confirmed COVID-19

https://www.cdc.gov/coronavirus/2019-ncov/prepare/cleaning-disinfection.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fcommunity%2Fhome%2Fcleaning-disinfection.html

CDC Recommends Facial Coverings for ALL public

https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html

https://files.constantcontact.com/b08df757101/cae7936f-e82a-4752-957b-ff3ba0cdc5ca.pdf

CDC Guidelines

https://www.cdc.gov/coronavirus/2019-ncov/community/index.html

OSHA

https://www.osha.gov/SLTC/covid-19/standards.html

Washington State Department of Health

https://www.doh.wa.gov/Emergencies/Coronavirus

Washington Labor and Industries

https://www.lni.wa.gov/agency/outreach/novel-coronavirus-outbreak-covid-19-resources

King County Guidelines

https://www.kingcounty.gov/depts/health/communicable-diseases/disease-control/novel-coronavirus/protection.aspx

Seattle-King, Pierce, and Snohomish Counties Guidelines

https://www.cdc.gov/coronavirus/2019-ncov/downloads/Seattle_Community_Mitigation.pdf

California PHD Guidelines

https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/ncov2019.aspx

Bay Area / San Mateo County Guidelines

https://www.smchealth.org/coronavirus

Los Angeles County Guidelines

http://www.publichealth.lacounty.gov/media/Coronavirus/

Orange County Guidelines

http://www.ochealthinfo.com/phs/about/epidasmt/epi/dip/prevention/novel_coronavirus

San Diego County Guidelines

https://www.sandiego.gov/coronavirus

This revision consists of the following updates:

12.1.1 *Ensure employees, craft and sub-contractors are not taking breaks, eating/buying lunch, or traversing through active owner-occupied facilities.*

12.1.2 Workers shall maintain at least six feet (6' 0") of social distance separation at all times. This shall include not only during direct work activities *but also during breaks, check-ins and person to person communication events, such as job walks, inspections, client visits, etc.*

12.1.2.1 Best Practice:

12.1.2.1.1 *Place workers in small controlled groups to maintain contact circles. A.k.a Family Groups!*

12.1.3 All choke points such as hallways, doorways, entry points, hand wash stations, bathrooms, elevators, manlifts, *mobile food service*, etc. are considered high risk areas and social distancing shall be practiced.

12.1.4 *Personnel involved operating and disinfecting man-hoists/elevators shall wear a N95/KN95 mask and nitrile gloves.*

12.1.4.1 Best Practice:

12.1.4.1.1. *Highlight markers on the ground and/or signage, etc.*
12.1.4.1.2. *When negative air machine placed in elevators a minimum of 3-foot social distance must be maintained.*
12.1.4.1.3. *Negative air machines in office trailers*

12.1.5 *If positive test identified on project no employees shall be transferred to another project until contract tracing is complete.*

12.1.6 Whenever possible the project shall either install and or address the following engineered controls in their risk mitigation plan:

12.1.6.1. Increasing ventilation rates in the work environment
12.1.6.2. Utilizing negative pressure ventilation machines *with HEPA filters in confined settings to reduce aerosol generating procedures*
12.1.6.3. Installing high efficiency air filters

12.1.7 *Personnel involved in disinfecting and cleaning of highly touched areas shall wear a N95/KN95 mask and nitrile gloves.*

12.1.8 *Workers who intentionally provide false information on the sign in app or fail to follow BNB pandemic protocols will be permanently removed from the project and/or terminated from employment (BNB*

Personnel). Subcontractors may be placed on notice and/or subjected to back charges when violating BNB Pandemic Protocols.

Mobile Elevating Work Platform

1.0 Purpose

1.1. The purpose of this procedure is to provide a system that minimizes the risks associated with BNBuilders (BNB) employees and / or Subcontractor employees using Aerial Work Platforms (AWPs) to carry out tasks on BNB projects.

1.2. For the purposes of this procedure, AWPs as used in this document includes:

1.2.1. Scissor Lifts
1.2.2. Knuckle Boom Lifts
1.2.3. Boom Lifts
1.2.4. Mast-Climbing Work Platforms
1.2.5. Vertical Lifts

2.0 Scope

2.1. This procedure applies to all occasions where BNB employees and / or Subcontractors employees use AWPs.

3.0 Responsibility

3.1 Project Management

3.1.1. It is the Project Manager's overall responsibility to ensure that this procedure is complied with on the project. The following responsibilities are to be assigned and monitored by the Project Manager and corrective action taken where the assigned responsibilities are not being carried out.

3.2 Project Supervision

3.2.1. The Site Superintendent(s) must understand this standard. They are to ensure that the BNB employees and/or Subcontractor employees carry out their assigned responsibilities regarding Aerial Work Platforms, as detailed below.
3.2.2. Site Supervisors are to make themselves familiar with and ensure the affected workers are trained in the contents of this procedure as well as trained per manufacturer requirements. They are to ensure that this procedure is complied with within their area of responsibility.
3.2.3. The Safety Manager/ Project Safety Coordinator/ Project Safety Representative is to provide competent assistance in developing and training the relevant BNB employees and/or Subcontractor employees in this procedure as required. They must also audit BNB employees and/or Subcontractor employees to ensure they are familiar with and understand the controls contained in this procedure.

3.3 Workers

3.3.1. Workers are to make themselves familiar with and understand the controls contained in this procedure to take short cuts or deviate from this procedure unless the new manner in which the carry out the tasks reduces the risks involved. They must be trained to operate specific AWPs and must carry training certifications on their person. BNB is required to get a copy of the workers certification before operation of any AWP.

4.0 Definitions

4.1. Aerial Work Platform (AWP) - A mechanical device used to provide temporary access for people or equipment to inaccessible areas, usually at height. Devices consist of both straight and articulating booms.
4.2. Capacity - The maximum amount that something can contain.
4.3. Insulated - Separated from other conducting surfaces by a dielectric (including air space) offering a high resistance to the passage of current.

4.4. Minimum Safe Approach Distance (MSAD) – The minimum distance that must be maintained, based on the voltage involved, by unprotected employees when exposed to energized parts.
4.5. Personal Fall Arrest System - A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.
4.6. Personal Fall Protection System - A personal fall protection system includes personal fall arrest systems, positioning device systems, fall restraint systems, safety nets and guardrails.
4.7. Platform - Any personnel-carrying device (bucket, basket, cage, stand, tub, or equivalent).
4.8. Safe Working Load - Is the load that a piece of lifting equipment, lifting device or accessory can safely lift, suspend, or lower without fear of breaking.
4.9. Scissor Lift - A motorized vehicle that has a raised platform which can be raised straight up in order gain access and perform work on areas that are difficult to reach.
4.10. Shall – Mandatory.

5.0 Procedure

5.1 Precautions

5.1.1. Only authorized and qualified persons shall operate an AWP.
5.1.2. Operators must be familiar with emergency controls and operation.
5.1.3. The Manufacturer's Operation and Safety Manual shall be located in a weather resistant compartment on the unit.
5.1.4. Operators must read, understand and comply with the Manufacturer's Operation and Safety Manual and applicable Federal, State and Local regulations.
5.1.5. Operators must use the AWP according to manufacturer's instructions.
5.1.6. Inspections shall be conducted according to manufacturer's instructions at the beginning of each shift. If any malfunctioning devices/controls, warning devices, safety devices, damaged equipment, missing or illegible decals and placards are discovered during this inspection, the unit must be taken out of service until repairs are completed.
5.1.7. Daily inspections must be documented. See attached AWP Daily Inspection Checklist. A checklist will be attached to each AWP.
5.1.8. Immediately before operation, the path of travel and work area must be checked for overhead obstructions, holes, slopes, excavations, bumps, ground conditions, floor obstructions, debris, power lines, and other potential hazards. All hazards discovered must be eliminated or protected prior to operation.
5.1.9. Unstable objects such as tools, materials and debris shall not be allowed to accumulate on the platform's floor.
5.1.10. At least one fire extinguisher must be located within 5' of the control panel.
5.1.11. When operating aerial work platforms near or over water, lift occupants are not required to tie off because in the event that an error occurred that resulted in the employees being in the water, being tied-off would exacerbate the drowning hazard. Fed OSHA Subpart CC 1926.1431 (K)(10)(i). Letter of interpretation amended June 18 2014. Letter # 20090601-9068.

5.2 Operating Instructions

5.2.1. AWPs shall only be used for positioning personnel, their tools, and equipment.
5.2.2. Operators shall use wheel chocks when using or parking an AWP on an incline.
5.2.3. Operators shall bring the AWP to a complete stop before using cell phones or two-way radios.
5.2.4. Traveling with the platform elevated should be minimized unless a spotter is used. Ensure that traveling speed is at the manufacturer's "creep" speed or not more than 0.5mph where manufacturer's speed is not known.

5.2.5. A spotter is mandatory when view is obstructed by load and during travel of aerial work platforms. Scissor lifts require spotters during movement in congested and/or hazardous areas.
5.2.6. Ensure that the AWP travels on gradients within the manufacturer's recommendations. In the absence of such recommendations, ensure the gradient is not over 3 degrees.
5.2.7. Aerial baskets shall not be supported by any structure or object at any time.
5.2.8. Operators shall not "slam" a control switch or lever through neutral to an opposite direction. Switch and levers shall always be returned to neutral and stop before moving the switch or lever to the next function.
5.2.9. Outriggers on an AWP must be retracted before movement.
5.2.10. Do not use the rails of an AWP to transport materials unless approved by the manufacturer.
5.2.11. AWPs shall never be used in vehicular travel paths without hard barricades or BNB approved administrative controls in place to protect the unit from inadvertent contact.
5.2.12. Ground personnel shall not use ground controls with personnel in the platform except for emergencies.
5.2.13. Operator's must lower the platform and shut off all power before leaving an AWP.
5.2.14. When lifts are used inside buildings, consideration must be given to carbon monoxide emissions.
5.2.15. Lifts must not be operated while batteries are being charged.

5.3 Hazards

5.3.1 Falls

5.3.1.1. Prior to operation, ensure all gates and rails are fastened and secured in their proper position
5.3.1.2. Enter and exit platforms through the gate
5.3.1.3. Operators shall face the AWP and maintain three points of contact when entering/exiting platform
5.3.1.4. Use extreme caution when entering or leaving the platform
5.3.1.5. Operators may only exit an elevated platform if it is an emergency or approved by BNB and the manufacturer. When exiting an elevated platform, 100% fall protection is required.
5.3.1.6. Never climb an AWP arm or boom
5.3.1.7. Fall Protection Equipment shall be used according to manufacturer's recommendations
5.3.1.8. Use manufacturer's approved fall protection anchorage points when attaching a lanyard
5.3.1.9. If aerial lifts are not equipped with anchorage points, the lift must be replaced with one that is equipped with manufacturer-installed anchorage points.
5.3.1.10. Keep oil, mud, and slippery substances cleaned from footwear
5.3.1.11. Ensure that the platform is fully lowered when exiting the platform
5.3.1.12. Operators shall always stand firmly on the floor of the basket and never sit or climb on the edge of the basket, or use planks, ladders or other devices to obtain additional height

5.3.2 Electrocution

5.3.2.1. Operators shall maintain distance from electrical lines, apparatus, or any energized (exposed or insulated) parts according to the following. Electrical line sway, tools, and equipment must also be taken into consideration when determining the Minimum Safe Approach Distance.

Voltage Range (phase to phase)	Minimum Safe Approach Distance
0 to 50KV	10'
Over 50KV to 200KV	15'
Over 200KV to 350KV	20'
Over 350KV to 500KV	25'

Over 500KV to 750KV	35'
Over 750KV to 1000KV	45'

Electrical lines >50,000 volts require one-foot additional clearance for every additional 30,000 volts

5.3.3 Tipping

5.3.3.1. AWPs shall not be operated in high winds as defined by the manufacturer in the Operation and Safety Manual
5.3.3.2. Operators shall ensure that the ground conditions are adequate to support the maximum tire load indicated on the tire load decals located on the chassis adjacent to each wheel
5.3.3.3. Tire pressure shall be checked prior to every shift
5.3.3.4. Operators shall not operate a raised AWP on a slope, uneven, or soft surface
5.3.3.5. Material and equipment must be kept within the confines of the platform at all times
5.3.3.6. Rigging shall not be used from an AWP to pick up and move material
5.3.3.7. Operators shall not secure an AWP to an adjacent structure
5.3.3.8. Safe working load limits and platform capacities shall not be exceeded
5.3.3.9. Extreme caution must be exercised when traveling down a slope

5.3.4 Crushing and Collision Hazards

5.3.4.1. All telescoping/articulating aerial work platforms (telescoping boom lifts) shall be equipped with secondary guarding that provides crush/entrapment protection (see photo below).
5.3.4.2. Hardhats must be worn at all times
5.3.4.3. Operators shall keep their body and extremities inside the platform and off the railing during operation
5.3.4.4. AWPs must not be operated when the operator's vision is obstructed
5.3.4.5. Operators shall always face in the direction of travel
5.3.4.6. Operators shall always check clearances above, on sides, and bottom of the platform before raising and lowering the platform
5.3.4.7. Operators must take appropriate measures to protect workers and pedestrians below overhead work by establishing a controlled access zone/restricted area/exclusion zone.

5.4 Hazard Controls

5.4.1 Engineering Controls

5.4.1.1. All measures shall be taken to eliminate the need to work at height. If it is not feasible, AWPs may be used to elevate a worker to a work position.

5.4.2 Administrative Controls

5.4.2.1. All measures shall be taken to separate workers and AWP operations such as, hard barricades, controlled access zones, spotters, flaggers and scheduling operations to eliminate and mitigate exposure to workers and members of the public.

5.4.3 Personal Protective Equipment

5.4.2.1. Workers using AWPs should wear personal fall protection equipment in the form of a full body harness and lanyard attached to the manufacturer's prescribed anchorage point. The lanyard should be configured to prevent excess slack and must not be attached to an adjacent pole, structure, etc.
5.4.2.2. Body belts are allowed for body restraint, not for fall arrest systems.
5.4.2.3. Operators shall use personal fall protection equipment according to manufacturer's recommendations.

5.5 Training

5.5.1. Contractors whose personnel operate AWPs must provide adequate documentation of training.

5.5.2. *Operator training must cover at a minimum:*

5.5.2.1. Use and limitations of the controls in the platform and at the ground, emergency controls and safety features
5.5.2.2. Control labels, instructions and warnings on the machine
5.5.2.3. Rules of their employer and governmental regulations
5.5.2.4. The care and safe use of approved fall protection
5.5.2.5. Enough knowledge of the mechanical operation of the AWP to recognize a malfunction or potential malfunction
5.5.2.6. The safest means to operate the machine where overhead obstructions, other moving equipment and obstacles depressions, holes and drop-offs exist
5.5.2.7. Means to avoid the hazards of unprotected electrical conductors
5.5.2.8. Specific job requirements or machine application (hands-on training with specific model of AWP)
5.5.2.9. Reading and understanding the Operation and Safety Manual
5.5.2.10. The nature of hazards associated with the equipment such as trip and falls, electrocution, tipping, and crushing and collision

6.0 References

L&I WAC 296-869 – Elevating Work Platforms

Cal/OSHA T8 CCR 3636 Article 24 – Elevating Work Platforms and Aerial Devices

Fed/OSHA 29CFR1926.453 - Aerial Lifts

Fed/OSHA 29CFR1926.556 – Aerial Lifts

7.0 Attachments

Aerial Work Platform Inspection Checklist

Occupational Health

1.0 Purpose

1.1. The purpose of this standard is to identify and control risks arising from physical, chemical, and other workplace hazards in order to establish and maintain a safe and healthy working environment. Workplace hazards may include chemical agents and solvents, heavy metals such as lead and mercury, and physical agents such as loud noise or vibration.

2.0 Scope

2.1. This standard applies to all tasks conducted on BNBuilders projects.

3.0 Responsibility

3.1 Project Management

3.1.1. BNB Project Management & Supervision are responsible for completing a Preconstruction Risk Assessment for the project in order to identify occupational health hazards that personnel may be exposed to as well as controls for the hazards. BNB Project Management & Supervision must ensure the identified hazards and controls are planned for accordingly via preconstruction meetings with affected personnel and documented on JHAs, PTPs, etc.

3.2 Workers

3.2.1. Workers who will engage in tasks with occupational health exposures are responsible for following their employer's procedures, the JHA, and the PTP.

4.0 Definitions

4.1. Pandemic - an epidemic of infectious disease that has spread through human populations across continents. (Examples would be smallpox, tuberculosis, H1N1 flu, NOT seasonal flu)
4.2. Ergonomics - the applied science of designing and arranging things people use, so that people and things interact efficiently and safely.
4.3. Occupational Health - refers to the identification and control of the risks arising from physical, chemical, and other workplace hazards in order to establish and maintain a safe and healthy working environment. These hazards may include chemical agents and solvents, heavy metals such as lead and mercury, and physical agents such as loud noise or vibration.

5.0 Procedure

5.1 Asbestos

5.1.1. It is the policy of BNB to not have our employees work with or disturb asbestos. Once asbestos has been identified, an approved removal company will be called in to remove and clean the area. Workers are not allowed to resume activities in that area until clearance sampling has approved the area as safe.
5.1.2. Asbestos will not be removed unless there is a documented test from an approved laboratory.
5.1.3. Workers will understand many areas are not always surveyed for different reasons and they need to be vigilant for possible asbestos containing materials that may not have been accessible or a part of the good faith survey.

5.1.4 Asbestos Discovery - If asbestos-containing material is found, the following procedures shall be followed:

5.1.4.1. Stop work.
5.1.4.2. Secure the scene.

5.1.4.3. Contain the asbestos.
5.1.4.4. Notify the superintendent immediately.
5.1.4.5. Contact the applicable Loss Prevention team member.
5.1.4.6. An abatement contractor shall be contacted to abate the area. It is the policy of BB for employees to not directly perform asbestos abatement work.

5.1.2 Asbestos Training:

5.1.2.1. Personnel whom have the possibility of exposure to asbestos containing materials will be required at a minimum to attend an annual two-hour training class on asbestos awareness. Anyone that could possibly be exposed either through sales calls, pre job visits or performance of normal work duties will be required to go through training.
5.1.2.2. Anyone using air monitoring equipment will be trained on the proper use of the device.
5.1.2.3. Training must include all elements listed in Federal or local requirements.

5.2 Lead

5.2.1. Workers may be exposed to lead in a number of situations such as during work in older buildings and while working with sound proofing, air handling units, pipe joints, air vents, drywall, flooring, etc.
5.2.2. If air monitoring is available, 50 micro grams per cubic meter of air is the action level. If air monitoring shows results above the action level, monitoring will be conducted every 6 months until two consecutive results are below the action level. Workers will be notified in writing of air monitoring results and corrective actions taken. Those air monitoring results, and corrective actions will be posted on the bulletin board.
5.2.3. If a job will have lead exposures, a site-specific plan will be set up to minimize the exposures. This compliance program will be created in concert with consultants.
5.2.4. To provide complete protection for workers possibly exposed to lead, respirators will be worn in emergencies, and until other engineering or work practice controls can be implemented and deemed enough. All PPE needed will be provided at no cost to the employee.
5.2.5. Areas where workers are being exposed above the lead PEL will be posted with signs warning of the lead hazard.

5.2.1 A Competent Person or third party should be appointed who will be responsible for:

5.2.1.1. Performing regular inspections of the job site materials and equipment during the job.
5.2.1.2. Notifying the BNB Safety manager whenever there is a change in the lead job that has not been addressed by the Lead Compliance Plan.
5.2.1.3. Requiring that Engineering Controls are on site and installed correctly before work begins.
5.2.1.4. Implementing the engineering controls specified in the Lead Compliance Plan for the site.
5.2.1.5. Making sure the following hygiene facilities are provided which include:
5.2.1.5.1. A clean change room equipped with separate Lockers for the storage of street clothes and work clothes.
5.2.1.5.2. A shower and hand washing facilities.
5.2.1.5.3. A lunch area free from lead contamination.
5.2.1.6. Establishing rules that will maintain proper housekeeping in the lead abatement area, specifically:
5.2.1.6.1. Prohibit contaminated clothing and equipment outside of lead work area.
5.2.1.6.2. Require lead workers to shower at the end of the shift and wash up before eating and drinking outside the lead area.
5.2.1.7. Labeling lead hazardous areas and equipment.
5.2.1.8. Marking lead hazardous areas with boundary tape and signs stating: WARNING, LEAD WORK AREA, POISON, NO SMOKING OR EATING
5.2.1.9. Marking lead contaminated equipment and debris with labels warning of the lead hazard.
5.2.1.10. Maintaining requirements of the Lead Compliance Plan throughout the job.

5.2.2 Negative Initial Determination:

5.2.2.1. Exposures to lead below an 8-hour time-weighted average of 30µg/m³ requires a written record which includes:

5.2.2.1.1. Date of determination.
5.2.2.1.2. Location within the worksite.
5.2.2.1.3. Name of each employee monitored.
5.2.2.1.4. Monitoring results.
5.2.2.1.5. Type of activity conducting during monitoring.
5.2.2.1.6. No further action regarding lead is required. Any levels above 30µg/m^3 requires enrollment in a medical surveillance program, possibly including a Lead Compliance Plan, and will not be done by BB employees. If exposures exceed 30µg/m^3 a qualified subcontractor will be hired.

5.2.2.2. It is recommended a third party be used to evaluate any abatement contractors to make sure procedures are followed.

5.2.2.3. These records must be on file on the jobsite:

5.2.2.8.1. Pre-Job Lead Hazard Initial Assessment.
5.2.2.8.2. Air monitoring results.
5.2.2.8.3. Clean letter
5.2.2.8.4. Lead Compliance Plan for the job (as necessary)

5.2.3 Interim Protection Measures:
Until the initial exposure assessment can be conducted, the following protective measures must be implemented:

5.2.3.1. Provide coveralls or other similar full body covering
5.2.3.2. Provide gloves, hats, shoes or disposable shoe coverings
5.2.3.3. Provide face shields, goggles or other appropriate protective equipment
5.2.3.4. Provide change areas and hand washing facilities

5.2.3.5. Provide half face respirators with HEPA cartridges where lead coatings or paint is present and any of the following activities will occur:

5.2.3.5.1. Manual demolition of structures
5.2.3.5.2. Manual scraping
5.2.3.5.3. Manual sanding
5.2.3.5.4. Heat gun applications
5.2.3.5.5. Power tool cleaning with dust collection applications
5.2.3.5.6. Spray painting with lead paint

5.2.3.6. Provide loose fitting hood or helmet powered air purifying respirator with high efficiency filters, or hood or helmet supplied air respirator operated in a continuous-flow mode when performing tasks involving:

5.2.3.6.1. Lead containing mortar
5.2.3.6.2. Lead burning
5.2.3.6.3. Rivet busting
5.2.3.6.4. Power tool cleaning without dust collection systems
5.2.3.6.5. Cleanup activities where dry expendable abrasives are used
5.2.3.6.6. Abrasive blasting enclosure, movement and removal

5.2.3.7. Provide full-face piece supplied air respirator operated in pressure demand or other positive pressure when performing tasks involving:

5.2.3.7.1. Abrasive blasting
5.2.3.7.2. Welding
5.2.3.7.3. Cutting
5.2.3.7.4. Torch burning

5.2.4 Lead Training:
BNB should ensure that personnel potentially exposed to lead are trained in the following:

5.2.4.1. The content of lead in construction-standard
5.2.4.2. The specific nature of the operations that could result in exposure to lead above the action level.
5.2.4.3. The purpose, proper selection, fitting, use, and limitations of respirators.
5.2.4.4. The purpose and description of the medical surveillance program and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead.
5.2.4.5. The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices.
5.2.4.6. The content of any lead compliance plan and the location of regulated areas in effect.
5.2.4.7. Instructions to employees that chelating agents should not be routinely used.
5.2.4.8. The employee's right of access to records.

5.3 Hexavalent Chromium

5.3.1. Activities involving the welding, cutting, grinding, and polishing of stainless steel may potentially expose personnel to hexavalent chromium. When these activities are to be conducted, adequate control measures must be in place unless employers can otherwise prove that they are not exposing their personnel to levels greater than the Permissible Exposure Limit. [The employer shall ensure that no employee is exposed to an airborne concentration of chromium (VI) in excess of 5 micrograms per cubic meter of air (5 $\mu g/m^3$), calculated as an 8-hour time-weighted average (TWA)].

5.4 Benzene

5.4.1. Workers may be exposed to Benzene (Gasoline, Diesel) when working on a fuel tank, in a refinery or pipeline location. When beginning work in one of these areas, a J/AHA and PTP shall be filled out discussing all possible hazards and precautions needed.
5.4.2. Besides flammable characteristics, Benzene has health hazards that include effects on the central nervous system, nausea, confusion, loss of coordination and dizziness. Some workers will feel "giddy" or excited before the onset of other symptoms. Nose and throat irritation along with headaches, loss of sleep and loss of memory are also common. The vapor can be irritating to the eyes but will not cause permanent injury.
5.4.3. Benzene is colorless, has an aromatic odor, is not soluble in water, and is both toxic and flammable. Because it is flammable, smoking or the use of heat or sparking sources is not allowed unless a hot work permit is approved for specific use. Fire extinguishers must be readily available.
5.4.4. Emergency procedures must always be available, discussed, included in the J/AHA and PTP. Those procedures must also include mop up procedures and location of PPE and emergency equipment in case of a spill.
5.4.5. PPE is required as with many exposures to protect the skin, eyes, and face.

5.5 PCB's

5.5.1. Light ballasts and other PCB containing material will be handled with appropriate PPE, stored in an appropriate spill containment storage device and an approved contractor will pick them up, provide a receipt, and properly recycle the remainder.
5.5.2. Any light ballasts that are leaking must be containerized and prioritized for recycling within 90 days. The container must be dated with the hazard (PCB BALLAST for recycling) and kept sealed and stored in a spill containment or accumulation area.

5.6 Silica

5.6.1. Respirable Crystalline Silica (RCS):

5.6.1.1. Each contractor engaged in a task that releases dust containing silica at the Action Level 25 µg/m³ must submit a Written Silica Exposure Control Plan to the BNBuilders project team, in order to avoid worker exposure for their own workers and other personnel. For assistants creating a plan reference www.silica-safe.org.

5.6.1.2. The plan will meet criteria set forth by CFR 1926.1153(g) and also include:

5.6.1.2.1. Specific tasks that could release silica (Exposure assessment).
5.6.1.2.2. Anticipated location start / end dates for each task.
5.6.1.2.3. Competent Person designation with (Mandatory) 3-hour Silica Training Certification
5.6.1.2.4. Specific Exposure Control Methods to reduce or eliminate silica release per CFR 1926.1153(c)(1) Table 1 (e.g. wet sawing or drilling, misting of dust, use of local exhausted power tools).
5.6.1.2.5. These plans will be shared with all contractors involved on the project who will review and incorporate them to avoid potentially significant exposures. Sometimes this may involve temporarily suspending operations in a specific area during a silica activity or scheduling the work activity for off hours.

5.6.2 Procedures:

5.6.2.1. All workers exposed to silica dust must wash their face and hands prior to smoking, drinking, eating and at the end of the shift.
5.6.2.2. Eating, drinking, smoking, use of chewing gum or tobacco is prohibited in all areas contaminated with silica dust.
5.6.2.3. Dry sweeping or dry brushing is not permitted along with the use of tools such as air compressors, leaf blowers, etc. to clean clothing or work surfaces that could contribute to the exposure of RCS on BNBuilders' job sites.
5.6.2.4. To the extent feasible, all worker vehicles should be parked away from an anticipated silica dust generating operations.
5.6.2.5. Workers with anticipated exposures at or above the OSHA Action level of 25 micrograms per cubic meter of air must wear protective clothing (i.e. disposable Tyvek suit or washable work clothing) that stays on site. In some situations, thoroughly vacuuming worker clothing with a HEPA filtered vacuum may be sufficient.
5.6.2.6. Air monitoring should be conducted to determine an Exposure Assessment at job sites where there is a potential for silica exposure at or above the action level. The purpose of the monitoring is to ensure that the appropriate level of respiratory protection and control method are chosen.

5.6.2.7. A reassessment of exposures will be conducted when a contractor has any reason to believe that new or additional exposures at or above the action level have occurred for the following:

5.6.2.7.1. change in the production
5.6.2.7.2. change in process
5.6.2.7.3. change of control equipment
5.6.2.7.4. change of personnel or work practices.

5.6.3 Engineering control methods may involve the following:

5.6.3.1. Wet sawing
5.6.3.2. Wet drilling
5.6.3.3. Water mist or fog to control dust clouds
5.6.3.4. HEPA filtered local exhaust power tools
5.6.3.5. Enclosed, filtered, air-conditioned equipment cabs
5.6.3.6. Non-silica containing abrasives for use in abrasive blasting
5.6.3.7. Housekeeping to minimize accumulation of silica-containing waste (spent abrasive, drilling/grinding dust)
5.6.3.8. Clean up and containerize waste as soon as feasible after generation (HEPA vacuum, or wet sweeping only)

5.6.4 Administrative controls

5.6.4.1. Administrative controls can be used in conjunction with engineering controls to further reduce the likelihood of worker exposure or to minimize the number of workers who are over exposed.

5.6.4.2. These administrative controls may include:

5.6.4.2.1. Contractors who anticipate doing silica dust creating work should notify other contractors as far in advance as possible as to the location, date, start time and duration.

5.6.4.2.2. Contractors will to the extent feasible, limit silica generating work to off hours, or coordinate times when other contractors can vacate the immediate work area.

5.6.4.2.3. Contractors will leave the immediate work area while other contractors are conducting silica-generating operations above the 25 μg/m^3 Action Level

5.6.4.2.4. All areas with silica-generating activities will have silica warning signs posted at all access points and the area flagged off if necessary, to prevent unauthorized workers from entering during silica generating operations. For example:

5.6.4.3. Rotating workers from high silica exposure jobs to low exposure jobs during the day. All workers must be trained to a Hazard Communication level awareness of silica.

5.6.4.4. This training should cover the following topics:

5.6.4.4.1. Adverse health effects of silica.

5.6.4.4.2. Tasks, locations, jobs that may generate silica dust.

5.6.4.4.3. Methods, equipment, procedures to be used to minimize dust generation and importance of following procedures.

5.6.4.4.4. Methods used to determine worker exposure.

5.6.4.4.5. Need to avoid silica-generating activities and to vacate the area if feasible when a silica generating task is started.

5.6.4.4.6. Availability of any medical records that may be generated.

5.6.4.4.7. Availability of any air monitoring records that may be generated.

5.7 Pandemic Disease

5.7.1. In the event of Pandemic disease, the following will serve as guidelines:

5.7.1.1. Hand washing facilities will be provided and kept clean at every project. The use of hand sanitizers will be encouraged. No-touch trash cans, hand soap and disposable towels may be provided by management depending on the project's scope/location. Trash cans shall be provided near doors exiting rest room facilities. Routine cleaning and disinfection of lunch tables, countertops, door handles, keyboards, faucets and handrails will be a main priority.

5.7.1.2. Training will be done as needed to educate employees about health issues, prevention, and symptoms of disease. Protecting others at work will be emphasized, and when it is safe to come back to work. Supervisors will make every attempt to aid in allowing workers to tele-commute. Disease containment plans may be provided to employees through weekly emails, flyers and safety bulletin boards.

5.7.1.3. Workers will be allowed to tele-commute if they are staying at home to help care for family members. Supervision must work together with employees to minimize the worker bringing disease to work. Discussion of symptoms must be commonplace when talking about returning to work.

5.7.1.4. A discussion between the BNB Safety Director, Company President and Director of Human Resources will decide if and how work will continue due to excessive absenteeism from disease.

5.7.1.5. Immunizations will be provided when possible at all work locations to reduce absenteeism. A list of all preventative immunizations will be provided on safety bulletin boards and employees will be strongly encouraged to stay updated on all immunizations.

5.7.1.6. The BNB Safety Manager will work together with the marketing director, President and Director of Human Resources in communicating to customers and suppliers about our reduction in services and contact because of absenteeism. Those same contacts will receive communication when we resume normal services.

5.7.1.7. Large or crowded gatherings will be reduced or eliminated when an outbreak or increased level of a disease is in progress. All large or crowded gatherings and participation in such will be discussed with the BB Division Loss Prevention Manager before scheduling when an outbreak or increased level of a disease is in progress.

5.8 Ergonomics

5.8.1. Musculoskeletal disorders (MSDs) result when there is a mismatch between the physical capacity of workers and the physical demands of their jobs. All workers should be trained on proper lifting techniques, participate in daily stretch and flex, and refrain from kneeling on hard surfaces.

5.8.2 Repetitive motions

5.8.2.1. Risk Factors:

5.8.2.1.1. Constant lifting and placing of material (pipe, conduit, rebar)
5.8.2.1.2. Hammering
5.8.2.1.3. Squeezing snips, drill triggers, etc.
5.8.2.1.4. Repeating the same task
5.8.2.1.5. Turning wrenches

5.8.2.2. Preventive Controls:

5.8.2.1.1. Use mechanical lifting devices
5.8.2.1.2. Use spring-loaded hand tools with protective grips
5.8.2.1.3. Use tools with multi-finger triggers and contact switches
5.8.2.1.4. Rearrange tasks

5.8.3 Sustained (awkward) postures

5.8.3.1. Risk Factors:

5.8.3.1.1. Twisting, reaching, and bending
5.8.3.1.2. Remaining in the same position for long periods at a time

5.8.3.2. Preventive Controls:

5.8.3.2.1. Reposition your body to a more neutral posture
5.8.3.2.2. Select tools that reduce awkward postures
5.8.3.2.3. Use an adjustable work surface
5.8.3.2.4. Move closer to your work
5.8.3.2.5. Use energy absorbing floor mats

5.8.4 Forceful exertions

5.8.4.1. Risk Factors:

5.8.4.1.1. Material handling (lifting over 50 lbs. repetitively)
5.8.4.1.2. Gripping hand tools

5.8.4.2. Preventive Controls:

5.8.4.2.1. Use mechanical devices (genie Lift, stair climber, gantry crane, roustabout, lift gates)
5.8.4.2.2. Use two workers to lift equipment and materials (do not twist)
5.8.4.2.3. Use spring-loaded tools
5.8.4.2.4. Use extended handles to reduce bending and reaching
5.8.4.2.5. Use casters/swivels or wheels

5.8.5 Vibration exposure

5.8.5.1. Risk Factors:

5.8.5.1.1. Working with vibrating power tools (Jackhammer, Roto hammer)
5.8.5.1.2. Operating a forklift (body vibration)

5.8.5.2. Preventive Controls:

5.8.5.2.1. Add dampening devices to tools, machines, and motorized vehicles
5.8.5.2.2. Rotate crews
5.8.5.2.3. Wear protective gloves
5.8.5.2.4. Use anti-vibration power tools
5.8.5.2.5. Use handle covers to decrease vibration
5.8.5.2.6. Suspend/support tools to reduce vibration
5.8.5.2.7. Use energy absorbing floor mats

5.8.6 Extreme temperatures

5.8.6.1. Risk Factors:

5.8.6.1.1. Working in hot/cold environments
5.8.6.1.2. Working with tools/equipment/mechanical devices that are hot/cold

5.8.6.2. Preventive Controls:

5.8.6.2.1. Increase/decrease air temperature
5.8.6.2.2. Wear appropriate clothing
5.8.6.2.3. Wear protective gloves
5.8.6.2.4. Drink plenty of fluids
5.8.6.2.5. Control exposure through crew rotations

5.8.7 Improper tool use/design

5.8.7.1. Risk Factors:

5.8.7.1.1. Using improperly designed tools (hand tool without proper design, overuse)
5.8.7.1.2. Using tool for inappropriate purpose
5.8.7.1.3. Broken tools or equipment

5.8.7.2. Preventive Controls:

5.8.7.2.1. Use tools that decrease wrist deviation
5.8.7.2.2. Use tools for intended task
5.8.7.2.3. Inspect tools/equipment prior to use
5.8.7.2.4. Use two handle grips
5.8.7.2.5. Use trigger less tools, and tools with contact switches and multi-finger triggers

5.9 Hepatitis B

5.9.1. Subcontractors who will be working on preexisting sewage pipes must have their personnel; vaccinated from Hepatitis B or have signed waivers; trained on the applicable hazards including potential hepatitis B exposure; and must properly equip their personnel with protective equipment.

5.10 Other Dusts, Fumes, Mists, Vapors, and Gases

5.10.1. Whenever an oxygen deficient atmosphere or harmful dusts, fumes, mists, vapors, or gases exist or are produced in the course of employment in quantities giving rise to harmful exposure of employees, such hazards shall be controlled by removing the employees from exposure to the hazard, by limiting the daily exposure of employees to the hazard, or by application of engineering controls. Whenever such controls are not practicable or fail to achieve full compliance, respiratory protective equipment shall be provided in accordance with applicable federal, state, or local requirements.

6.0 References

CDC guidelines

CALOSHA Title 8 Subchapter 7 - Occupational Health Requirements

L&I WAC 296-800 – Core Safety

L&I WAC 296-155-100 – Occupational Health

FEDOSHA Occupational Health Requirements

7.0 Attachments

Pre-Task Plan

Hazard Communication Program

Personal Protective Equipment

1.0 Purpose

1.1. Hazards may exist on construction projects in many different forms: sharp edges, falling objects, flying sparks, chemicals, noise, and a myriad of other potentially dangerous situations. When engineering, work practice, and administrative controls are not feasible or do not provide enough protection, personnel must be provided with Personal Protective Equipment (PPE) that will minimize exposure. Examples of PPE are gloves, foot and eye protection, protective hearing device (earplugs, earmuffs), hard hats, respirators, and full-body suits.

2.0 Scope

2.1. The policy outlines the various types of PPE requirements on BNB projects.

3.0 Responsibility

3.1 Project Management

3.1.1. BNB Project Management and Supervision will review submittals to ensure that each subcontractor has an adequate PPE program for the work they are performing.
3.1.2. During work activities, BNB Project Management and Supervision will ensure that PPE is adequate, applicable, and properly worn for the hazards to which personnel are exposed.
3.1.3. BNB Project Management and Supervision must ensure that attempts have been made to control hazards with engineering, work practice and administrative controls before having personnel don PPE.

3.2 Workers

3.2.1. Workers who are required to wear PPE must follow the requirements of their employer and BNB.
3.2.2. Workers must properly wear PPE, attend training sessions on PPE, care for, clean and maintain PPE.
3.2.3. Inform Supervision of the need to repair or replace PPE.

4.0 Definitions

4.2. **PPE –** Personal Protective Equipment
4.3. **ANSI –** American National Standards Institute

5.0 Procedure

5.1. PPE should be of safe design and construction and should be maintained in a clean and reliable fashion. It should fit well and be comfortable to wear, therefore encouraging its use. If PPE does not fit properly, it can make the difference between being safely covered or dangerously exposed. Many categories of PPE are required to meet or be equivalent to standards developed by the American National Standards Institute (ANSI).

5.2 Hazard Controls

5.2.1 Engineering Controls

5.2.1.1. Engineering controls such as the elimination or substitution of a hazard must first be attempted prior to prescribing PPE for a task.

5.2.1 Administrative Controls

5.2.1.1. Employers with personnel who are required to wear PPE must train each worker on the following in regards of PPE:

5.2.1.1.1. When it is necessary

5.2.1.1.2. What kind of PPE is necessary?
5.2.1.1.3. How to properly don, adjust, wear and take off PPE
5.2.1.1.4. The limitations of the equipment
5.2.1.1.5. Proper care, storage, maintenance, useful life, and disposal of the PPE

5.2.2 Personal Protective Equipment

5.2.2.1. Head Protection

5.2.2.1.1. ANSI Z89 Head Protection is required 100% of the time.
5.2.2.1.2. Employees shall wear hard hats that are in good condition and meet legislative jurisdictional requirements. Bump hats, metal hard hats, and cowboy-style hard hats are not permitted.
5.2.2.1.3. Welding hoods must be worn with a hard hat. Cutting goggles must be worn with oxyacetylene cutting activities.
5.2.2.1.4. Alteration / painting of hard hats is prohibited. Hard hats shall be worn in the manner prescribed by the manufacturer. Only head apparel designed to be worn under a hard hat are allowed.

5.2.2.2. Hearing Protection

5.2.2.2.1. Hearing protection devices shall be used when noise level is at 85 dBA or above. Typical rule of thumb is employees should be using hearing protection if they are unable to hear a normal conversation within three feet.
5.2.2.2.2. See Hearing Conservation Policy for additional information.

5.2.2.3. Eye and Face Protection

5.2.2.3.1. ANSI Z87.1 Protection is required 100% of the time.
5.2.2.3.2. All components of prescription glasses used for eye protection including side shields must meet ANSI Z87.1 Standard.
5.2.2.3.3. Over-the-glass safety glasses or goggles are required for prescription glasses that do not meet ANSI Z87.1 Standard.
5.2.2.3.4. Workers must wear properly fitting eye and face protection. Only clear or indoor/outdoor safety glasses are allowed during interior work. Face and eye protection shall be kept clean and in good condition. Face protection must be worn during the following:
5.2.2.3.4.1. Grinding;
5.2.2.3.4.2. Chipping;
5.2.2.3.4.3. Cutting;
5.2.2.3.4.4. Splashing;
5.2.2.3.4.5. Or any other work that causes a projectile hazard.
5.2.2.3.5. During gas welding and cutting operations, tinted safety glasses are inadequate – appropriate eye protection for welding operations are required.
5.2.2.3.6. When using lasers, appropriately rated laser-safety goggles must be worn for the wavelengths of laser used.

5.2.2.4. Hand and Arm Protection

5.2.2.4.1. Cut-resistant gloves shall be worn at all times by all persons on-site except when advised against by a tool manufacturer for reason that gloves may increase the hazard potential (i.e., entanglement in moving parts, belts, or shafts).
5.2.2.4.2. All gloves shall have a minimum cut level of A3 (ANSI Cut Level 3at 1,000-1,499 grams to cut).

5.2.2.4.3. Each task shall be analyzed to determine the appropriate type of glove needed since specialty gloves may be required for exposure to sharp materials, chemicals, hot work, electricity, etc.

5.2.2.4.4. All gloves must be in good condition and fully intact – the fingers of the gloves may not be cut off. When arms may be exposed to sharp objects, adequate protective sleeves must be worn (i.e., drywall track, sheet metal, metal framing, demo work, etc.)

5.2.2.5. Body Protection

5.2.2.5.1. Personnel are required to wear high visibility clothing. Workers performing flagging operations must wear the proper class high visibility clothing based on the traffic conditions.

5.2.2.5.2. Employees shall come properly dressed to perform work activities with long pants and shirts with at least four-inch sleeves. Shorts and sleeveless shirts are prohibited at all times.

5.2.2.5.3. Additional body protection may be required depending on the task and potential hazards. For example, a protective apron is required by the operator during mortar mixing operations.

5.2.2.6. Foot and Leg Protection

5.2.2.6.1. All personnel must wear sturdy boots with ankle protection and hard soles. No running shoes of any kind are permitted on work sites. No safety toe tennis shoes allowed.

5.2.2.6.2. Personnel exposed to struck-by or crushing hazards that may potentially injure their feet must wear metatarsal protection (i.e., the use of a whacker or jackhammer requires shoe covers).

5.2.2.6.3. Personnel exposed to chemical hazards that may potentially injure their feet must wear impervious shoe-protection.

5.2.2.6.4. Full-length protective chaps are required to be worn when using chainsaws, demo/chop/cut-off/gas-powered saws.

5.2.2.7. Respiratory Protection

5.2.2.7.1. Due to the complexity of respiratory protection requirements, please reference the Respiratory Protection Policy.

6.0 References

ANSI Z87.1 – Eye and Face Protection

OSHA Safety & Health Topics – Personal Protective Equipment

L&I WAC 296-800-160 – Personal Protective Equipment

CALOSHA Title 8 Subchapter 7 Group 2 Article 10 – Personal Protective Devices

7.0 Attachments

Pre-Task Plan

Pre-Task Planning

1.0 Purpose

1.1. The purpose of this policy is to establish the requirements for conducting daily Pre-Task plans of construction work activities on BNB projects.

2.0 Scope

2.1. The scope of this policy applies to both BNB field crews and Subcontractor field crews. For a broader task analysis, see the Job Hazard Analysis Policy.

3.0 Responsibility

3.1 Project Management

3.1.1. Project Management and Supervision are responsible for ensuring each crew is completing their Pre-Task Plans daily. Foreman are responsible for training the crews on each Pre-Task Plan, and ensuring they understand each work task listed.

3.2 Workers

3.2.1. Workers are responsible for reading, understanding, and signing the Pre-Task Plan each day before work begins. In some cases, employees may be asked to create the Pre-Task Plan for a given task to help them develop skills needed to become foreman.

4.0 Definitions

4.1. **Hazard –** A danger or risk.
4.2. **Controls –** determine the behavior or supervise the running of;

5.0 Procedure

5.1 General Requirements

5.1.1. The following items are requirements for the Pre-Task Plan:

5.1.1.1. Each Pre-Task Plan must be completed and signed **BEFORE WORK BEGINS.**
5.1.1.2. Each foreman responsible for their own crew must complete a Pre-Task Plan specific to that divisions work.
5.1.1.3. Pre-Task Plans must be submitted to BNB via email or a physical copy before work begins.
5.1.1.4. If deviation from the Pre-Task Plan, the Pre-Task Plan must be amended to reflect the changes in work process.
5.1.1.5. If, due to sudden changes in condition, your Pre-Task Plan no longer reflects the scope of work to be performed, a new Pre-Task Plan must be completed prior to the work beginning.
5.1.1.6. Subcontractors can utilize BNBuilders Pre-Task Plan form or their own form
5.1.1.7. Pre-Task Plans involving occupied spaces must include potential risks for tenants / occupants.
5.1.1.8. Pre-Task Plan training will be provided via Site-Specific Orientation

5.1.2. See Pre-Task Plan Template below for reference:

Hazards	Exist?		Hazards	Exist?	
	Yes	No		Yes	No
Falls			**Noise**		
From Height			**Vibration**		
On to hazard			**Fire**		
Of objects			Flammables / Combustibles		
(Other)			Ignition Sources		
Electric Shock			(Other)		
Overhead, Buried, Hidden Lines			**Chemicals**		
Cords / Leads			Dust		
Power Sources			Fumes / Gases / Vapors		
(Other)			Toxic / Allergenic		
Caught Between			Acid / Caustic		
Swinging / Rotating Equipment			Explosive / Reactive		
Pinch Points			(Other)		
Materials			**Buildings / Systems**		
Cave in			Charged systems		
(Other)			Hazardous Energy		
Struck by			Stored Energy		
Dropped Objects / Loads			Hazardous Materials / Chemicals		
Flying Material / Debris			Confined Spaces		
Equipment / Traffic			Structural		
Unstable Materials			(Other)		
(Other)			**Location**		
Walking / Working Surfaces			Occupied Space		
Slips / Trips			Public at Risk		
Holes / Uneven Surfaces			Asbestos / Lead		
Access / Egress			Mold		
(Other)			Hazardous Waste		
Material Handling			Medical Waste		
Overexertion / Strains			(Other)		
Cuts / Punctures			**Weather / Environment**		
Storage / Stacking			Heat / Cold		
Mechanical Equipment			Lightning		
Hoisting			Wind		
Hauling / Road Transport			Visibility		
Floor Loading			(Other)		
(Other)					

PPE	Basic Required	Additional (Circle)
Head	Hard Hat (Type I, G)	Type II Hat (side impact) / Class E (electrical)
Eyes	Glasses (ANSI Z87)	Chemical Goggles / Foam lined (dust) / Welding / Laser
Body / Arms	Shirt w/ 4" sleeve	Fall Harness / High Viz / Fire / Chemical / Arc Flash / Cut resistant
Knees / Legs	Long Pants	Knee Pads / Chaps / chemicals
Hands	Light Duty Gloves	Heavy Duty Gloves / Cut Resistant / Chemical / Welding / Thermal
Feet	Sturdy Work Boots	Rubber Boot / Steel Toe / Metatarsal / Electrical / Booties
Face		Plastic Face Shield / Mesh Face Shield / Welding Mask
Ear		Plugs / Muffs / Double
Breathing		Dust Mask / Filtering Respirator / Supplied Air
Other		

Job / Task Description	

Basic Job Steps	Hazards	Controls / Work Practices
Describe major tasks in order. What will you be doing? What equipment and tools are needed?	Identify the hazards of each step. What could go wrong? What could cause an accident?	Decide what controls are needed. What safe work practices must be used for each hazard? What training is required?

Prepared by:		Date / Time:	

Crew Member Signatures		

6.0 References

L&I WAC 296-800 – Core Safety

CALOSHA Subchapter 4 – Accident Prevention Program Ideas

FEDOSHA 29 CFR 1926.952 – Job Briefing

7.0 Attachments

Pre-Task Plan Form

Pressurized Lines

1.0 Purpose

1.1. Prior to initial operation of piping systems, testing must be conducted to check for leaks. Typically, the types of testing are pneumatic or hydrostatic. Regardless of the testing method used, the testing process is considered dangerous and must be performed with caution. To ensure the safety of personnel and the public, safety precautions must be enacted prior to conducting a test.

2.0 Scope

2.1. This procedure outlines the necessary actions and safe practices for **pressure testing lines** on BNB projects. This standard applies to the pressure testing of standard metal piping systems. Piping systems that are not covered by this standard are cast iron, fiberglass, plastic, PVC, and CPVC.

3.0 Responsibility

3.1 Project Management

3.1.1. BNB Project Management & Supervision are responsible for ensuring that pressure testing of lines is in accordance with this standard.

3.2 Workers

3.2.1. Workers engaged in pressure testing of lines are responsible for following their employer's safety program and procedures. Also, they must submit a detailed plan to BNBuilders prior to any pressurization of piping systems and/or the use of pneumatic plugs.

3.2.2. The American Society of Mechanical Engineers (ASME) provides thorough direction on piping systems and should be followed by personnel engaged in testing.

4.0 Definitions

4.1. **ASME** – American Society of Mechanical Engineers

4.2. **Absolute Pressure (psi)** - The sum of the atmospheric pressure and gauge pressure (psig).

4.3. **Ambient Pressure** - Encompassing pressure surrounding all sides.

4.4. **Anhydrous Ammonia** - a colorless, highly irritating gas with a sharp, suffocating odor. http://www.dir.ca.gov/title8/507.html

4.5. **Atmospheric Pressure** - The pressure of air at sea level, usually 14.7 psi (one atmosphere), or 0 Psig.

4.6. **Final / Service Pressure Test –** A pressure test conducted in accordance with the contract documents, e.g. specifications.

4.7. **Gauge Pressure (psig)** - Pressure measured by a gauge and indicating the pressure exceeding atmospheric.

4.8. **Low Pressure Pneumatic Testing of Brittle Piping Systems** - A test using a gaseous test medium, e.g. air, **at or less than 7 psi,** used to (leak and/or structural) test piping made of materials prone to brittle failure, including, but not limited to concrete, CPVC, and cast iron in lieu of a typical 10' of a liquid, head-pressure test.

4.9. **High Pressure Pneumatic Leak Test –** A test using a gaseous test medium, e.g. air, at 7 psi - 10 psi to check for leaks in a system and to verify that all joints and fittings are installed properly. May or may not be done in conjunction with a High-Pressure Structural Test or Final Test. The test duration should be limited to the time necessary to bring the system slowly to test pressure, check joints and fittings for leaks and the return of the system to a zero-energy state.

4.10. **High Pressure Pneumatic Structural Test –** A test using a gaseous test medium, e.g. air, under pressure greater than 7 psi but not more than the lesser of 150 psi or 1.25x operational design pressure for the purpose of verifying the structural integrity of a piping system including the piping, joints, fittings and other components. A High Pressure Pneumatic Structural Test must start with a High-Pressure Pneumatic Leak Test at 7 psi - 10 psi for at least 10 minutes. The pressure should then be increased in stages not exceeding the lesser of 25 psi or 25% of test pressure and held for not less than 5 minutes at each stage until the test

pressure is achieved. The test duration must not exceed the maximum duration specified in the BNB authorized plan / procedure, after which the piping system must be slowly returned to a zero-energy state.

4.11. Hydrostatic test - a way in which pressure vessels such as pipelines, plumbing, gas cylinders, boilers and fuel tanks can be tested for strength and leaks. Hydrostatic testing is the most common method employed for testing pipes and pressure vessels. The test involves filling the vessel or pipe system with a liquid, usually water, which may be dyed to aid in visual leak detection, and pressurization of the vessel to the specified test pressure. Pressure tightness can be tested by shutting off the supply valve and observing whether there is a pressure loss. The location of a leak can be visually identified more easily if the water contains a colorant. Strength is usually tested by measuring permanent deformation of the container.

4.12. Pneumatic Pressure Leak/Damage Detection/Monitoring – The practice of leaving pneumatic pressure on a piping system for an extended period (longer than the time necessary for Leak or Structural Testing) to help identify leaks caused by damage or other causes.

4.13. Pressure - A force acting on a unit area. Usually shown as pounds per square inch (psi).

5.0 Procedure

5.1 General Pressure Testing Requirements

5.1.1. Prior to initial startup, piping systems shall be tested for leakage. Typical leak testing methods consist of hydrostatic, pneumatic, or service. Hydrostatic testing shall be the first choice because it generates considerably less stored energy and thus involves less risk to workers.

5.1.2. Pneumatic testing is more dangerous for workers and should be performed only when hydrostatic testing isn't acceptable such as when one of the following conditions are present:

5.1.2.1. The piping system does not contain cast iron pipe or plastic pipe subject to brittle failure.
5.1.2.2. The system does not contain soldered or solvent cement joints.
5.1.2.3. The test pressure does not exceed 150 psig.
5.1.2.4. The system will be used in gas service, or for other reasons cannot be filled with water.
5.1.2.5. Traces of a test liquid would be detrimental to the intended use the piping.
5.1.2.6. The facility will not allow for hydrostatic testing.

5.1.3. Whichever method of testing is used, these guidelines must be followed prior to testing:

5.1.3.1. Notify personnel of area to be avoided due to risks during pressure testing.
5.1.3.2. Create an exclusion/controlled access zone for the work area.
5.1.3.3. Ensure that personnel conducting the test stand behind a barrier or away from the line-of-fire during pressurization.
5.1.3.4. Ensure that pedestrians are rerouted out of the area. Spotters may be needed to re-route pedestrians, if applicable.
5.1.3.5. Identify the maximum test pressure to be used (typically provided by an engineer or specifications).
5.1.3.6. Identify the pipe to be tested. Ensure that the system has been completed according to the drawings and that no ends of the piping system are left open.
5.1.3.7. Identify any adjacent equipment that could be affected by a failure and isolate or otherwise protect the equipment.
5.1.3.8. Examine all connections within the testing section prior to the test to ensure proper tightness. All joints including welds shall be left uninsulated and exposed for examination during the test.
5.1.3.9. Determine the pressure rating for all connected fittings and devices to ensure they are rated for the maximum test pressure.
5.1.3.10. Piping designed for vapor or gas may be provided with temporary supports if necessary, to support the weight of the test liquid.
5.1.3.11. Expansion joints which cannot sustain the reactions due to test pressure shall be provided with temporary restraint or isolated from testing.

5.1.3.12. Equipment that is not to be subjected to the test pressure shall be isolated from the piping. If a valve is used to isolate the equipment, its closure shall be capable of sealing against the test pressure without damage to the valve. Flanged joints at which blinds are inserted to isolate equipment need not be tested.

5.1.3.13. If the test pressure is to be maintained for a period of time during which the test fluid is subject to thermal expansion or any other source of over pressurizing during the test, precautions such as the installation of a relief device shall be taken to avoid excessive pressure.

5.1.3.14. Ensure that all necessary lock out tag out procedures have been completed.

5.1.3.15. Verify that all non-essential personnel are clear from the area.

5.1.3.16. Inform all affected personnel that the test is about to start.

5.1.4. Post Test Requirements:

5.1.4.1. Release pressure before attempting to repair any leaks. Never attempt to repair leaks while the system is under pressure.

5.1.4.2. Drain the system. Carefully follow the procedures to safely and gradually release the pressure from the system and collect the waste liquid test medium when required. Caution must be taken to avoid escaping air stream, debris, and high noise levels.

5.1.4.3. Repair any leaks that were found. Lock out tag out procedures must be followed during leak repair.

5.1.4.4. Retest the system if necessary.

5.1.4.5. Complete any appropriate forms/logs to document test completion/pass.

5.1.5. Hydrostatic Testing Specifics:

5.1.5.1. Pressurization Plans should follow Owner's/manufacturer's/engineer's specification and procedures and be planned and written in compliance with ASME B31.9 – Building Services Piping, NFPA 24.2.2.1, and other applicable standards.

5.1.5.2. Temporary End Closure plate size and weld details must use one of the three weld types specified in ASME B31.9.

5.1.5.3. Ambient-temperature water shall be used as the test medium except where there is a risk of damage due to freezing. Another liquid may be used if it is safe for personnel and compatible with the piping.

5.1.5.4. Vents shall be provided at high points in the system to release trapped air while filling the system. Drains shall be provided at low points for complete removal of the test liquid.

5.1.5.5. The system shall be examined to see that all equipment and parts that cannot withstand the test pressure are properly isolated. Test equipment shall be examined to ensure that it is tight and that low-pressure filling lines are disconnected.

5.1.5.6. The test pressure shall not exceed the maximum test pressure for any vessel, pump, valve, or other component in the system under test. A check shall be made to verify that the stress due to pressure at the bottom of vertical runs does not exceed either of the following:

5.1.5.6.1. 90% of specified minimum yield strength;

5.1.5.6.2. 1.7 times the SE value in Appendix A of ASME's b31.9-1996 (for brittle materials)

5.1.5.7. Following the application of hydrostatic test pressure for at least 10 minutes, examination shall be made for leakage of the piping at all joints and connections. If leaks are found, they shall be eliminated by tightening, repair, or replacement, as appropriate, and the hydrostatic test repeated until no leakage is found.

5.1.6. Pneumatic Testing Specifics:

5.1.6.1. Pneumatic Pressurization Plans should follow Owner's/manufacturer's/engineer's specification and procedures and be planned and written in compliance with ASME B31.9 – Building Services Piping, NFPA 24.2.2.1, and other applicable standards.
5.1.6.2. Owner's contract documents and/or certain manufacturers may prohibit or restrict pneumatic pressurization of piping systems.
5.1.6.3. Pneumatic testing generates potentially dangerous stored energy because the air or gases are easily compressed when used in the systems without liquid. 500 feet of six-inch pipe at 150 psi is equal to five pounds of TNT (MCAA Guide to Pressure Testing Safety).
5.1.6.4. Pneumatic Pressurization of PVC piping systems is prohibited by BNB.
5.1.6.5. Compressed gas poses the risk of sudden release of stored energy.
5.1.6.6. The gas used for pneumatic testing shall be nonflammable and nontoxic.
5.1.6.7. Prior to any application of full pneumatic test pressure, a preliminary test of not more than 10 psig shall be applied to reveal possible major leaks.
5.1.6.8. The test pressure shall not exceed the maximum allowable pneumatic test pressure for any vessel, pump, valve, or other component in the system under test.
5.1.6.9. The test pressure shall not exceed 1.25 times the design pressure. Pressure shall be applied in several stages, allowing time for the system to reach equilibrium at each stage.
5.1.6.10. After the preliminary test, pressure shall be raised in stages of not more than 25% up to full pneumatic test pressure, allowing time for equalization of strains and detection of major leaks at each stage. Following the application of test pressure for at least ten minutes, the pressure may be reduced to design pressure and examination shall be made for leakage of the piping. Leaks may be detected by soap bubble, halogen gas, scented gas, test gage monitoring, ultrasonic, or other suitable means. If leaks are found, pressure shall be vented in accordance with Lock Out Tag Out Procedures, appropriate repair or replacement shall be made, and the pneumatic test repeated until no leakage is found.

5.1.7. Service Testing Specifics:

5.1.7.1. For gases, steam, and condensate services not over 15 psi, and for nontoxic, noncombustible, nonflammable liquids at pressures not over 100 psig and temperatures not over 200 F, it is permissible to conduct the system testing with the service fluid. This method is called Service Testing in which a preliminary test with air at low pressure may be used. The piping system is brought up to operating pressure gradually with visual examination at a pressure between one-half and two-thirds of design pressure. A final examination shall be made at operating pressure. If the piping system is free of leaks, it will have met the requirements for testing.

5.1.8. Pneumatic/Expansion/Serrated Plugs:

http://www.dir.ca.gov/title8/560.html

5.1.8.1. Pneumatic plugs can cause serious injury if they burst or are ejected from a pipe. Employer confirmation (letter) must be submitted to BNB assuring safe pneumatic plug use training has been completed by workers before they begin activities that may include pneumatic plugs. Pneumatic plugs may not be used for high pressure testing.
5.1.8.2. The use of expansion plugs or serrated plugs without through stays is limited to 6" nominal pipe size and/or 150 psi; for use of such devices above these limits specific written test procedures must be developed by the employer to protect against injury in the event the plug blows out.

5.1.8.3. Such instructions may include applicable data and recommendations furnished by the plug manufacturer and must include the following as a minimum:

5.1.8.3.1. Identification by function of the personnel responsible for the various procedures.
5.1.8.3.2. The test plugs must be well maintained and inspected by the designated employee before use.

5.1.8.3.3. Any opening to be plugged shall satisfy any limitation on straightness, roundness and diameter and shall be cleaned of dirt, mill scale or oil.
5.1.8.3.4. The plug must be of the correct size and pressure rating, including any limitations on the test fluid or test temperature. It must be inserted for full length of engagement, in accordance with the plug manufacturer's instructions.
5.1.8.3.5. The test piece must be so oriented to minimize probability of the plug striking personnel or equipment if the plug is ejected. All air must be vented from objects to be hydrostatically tested. Test plugs shall be barricaded or equipped with arresting devices when pneumatic pressure is used for testing.
5.1.8.3.6. Provision shall be provided for safe egress. No one shall be allowed to stand in front of the test plug or in line of probable trajectory during test.
5.1.8.3.7. No one shall be allowed to stand on top of the object being tested, or on a ladder to the test section until the test object is brought up to full test pressure, held at test pressure for at least ten minutes, and pressure is reduced to a predetermined safe level.
5.1.8.3.8. Pressurization shall be stopped at intervals to check pressure gage(s) and position of test plug(s).
5.1.8.3.9. The test pressure shall be reduced to zero before the plugs are loosened for removal.
5.1.8.3.10. Damaged or expanded closure ends must be cut off.
5.1.8.3.11. All repairs to test plugs shall follow the plug manufacturer's instructions.

5.1.9. Protection Against Overpressure:

5.1.9.1. Pressure during test must be controlled within 5% above the required test procedure. Protection against overpressure must be provided at 110% of the test pressure. A relief valve setting of 133% of the test pressure may be used, for elastic materials only, where calculations show that 133% of the test pressure will not exceed 90% of the specified minimum yield strength of the material. The discharge from the safety relief valve or rupture disc must be led full size to a safe place.

5.1.9.2. The requirement for a relief valve may be waived by a Qualified Pressure Vessel Safety Engineer or Certified Pressure Vessel Inspector if the only source of test pressure is a hand pump.

5.2 Hazards

5.2.1. The pressurization of piping systems and/or the use of pneumatic plugs creates the potential for the sudden release of stored energy which can result in catastrophic damage and/or injury. The risk from a failing joint, connection, gauge, valve, fitting or another component increases during the testing process, especially during pneumatic testing.

5.2.2. Potential hazards associated with pressure testing lines may be:

5.2.2.1. Fatalities and injuries caused by struck-by equipment/material, whipping hoses, flying material/equipment/objects/shrapnel (i.e., lacerations, contusions, bone fractures/breaks, puncture wounds, concussions, internal injuries, etc.)
5.2.2.2. Air injection into the body which could cause an air embolism and obstruct blood flow to the heart. This condition could be fatal in extreme cases.
5.2.2.3. Foreign objects in the eye
5.2.2.4. Hearing loss from sustained high-noise levels
5.2.2.5. Oxygen displacement and/or asphyxiation from an inert gas used for testing
5.2.2.6. Flooding in areas where energized electrical sources are present leading to electrocution
5.2.2.7. Freezing of pipes
5.2.2.8. Environmental hazards (from fuel testing)

5.2.3. Hydraulic systems must store fluid under high pressure. Three kinds of hazards exist:

5.2.3.1. burns from the hot, high pressure spray of fluid;
5.2.3.2. bruises, cuts or abrasions from flailing hydraulic lines; and
5.2.3.3. injection of fluid into the skin.

5.2.4. Common causes of pressure testing failures may consist of:

5.2.4.1. over pressurizing a system
5.2.4.2. inadequate/improper pressure testing equipment
5.2.4.3. poor system/component design
5.2.4.4. operator error
5.2.4.5. inadequate repairs/modifications to a system
5.2.4.6. failure to properly isolate parts being tested from other parts of a system
5.2.4.7. failure to properly isolate equipment from the piping system being tested

5.3 Hazard Controls

5.3.1 Engineering Controls

5.3.1.1. When feasible and allowed, hydrostatic testing shall be chosen over pneumatic.

5.3.2 Administrative Controls

5.3.2.1. Personnel that review pressure testing plans, procedures, checklists, and permits must have the ability to identify deficiencies.
5.3.2.2. Procedures and plans must have in-depth details necessary to safely perform pressure testing.
5.3.2.3. Pipe/equipment manufacturer's specifications for installation and testing must be clearly and specifically addressed in procedures.
5.3.2.4. Lock Out Tag Out Programs must have procedural detail necessary to safely control stored energy during pressure testing.
5.3.2.5. Zero-energy verification must occur prior to attempting end-cap removal or leak correction.
5.3.2.6. A pre-test safety meeting should be held with all personnel involved with a pressure test to review the pre-test safety plan, procedures, JHA, PTP, checklists, permits, etc. created for the specific pressure testing application.
5.3.2.7. Signage should be posted, and barricades installed prior to testing.
5.3.2.8. Personnel engaged in testing should be physically located out of the line-of-fire during testing.

5.3.3 Personal Protective Equipment

5.3.3.1. All personnel within test areas shall be required to wear eye protection, hard hats, hand protection, and hearing protection.
5.3.3.2. Eye protection should always be worn because there is a risk that particles or debris can be blown into the eye. Face shields should be worn when applicable. Hearing protection is also used if there is a consistent hissing or whistling of air leaks.
5.3.3.3. If possible, protective barriers should be in place during testing.

5.4 Training

5.4.1. Personnel engaged in pressure testing must be trained on:

5.4.1.1. the test process that they will be using for the specific application,

5.4.1.2. applicable procedures,
5.4.1.3. the Job/Activity Hazard Analysis and Pre-Task Plan,
5.4.1.4. safety and personal protective equipment
5.4.1.5. communication methods during testing (i.e., radios, cell phones, signage, etc.)
5.4.1.6. emergency procedures
    5.4.1.6.1. emergency shutdown procedures
    5.4.1.6.2. emergency contact information and phone numbers

6.0 References

ASME Standard Number: ASME B31.9-1996 Title: Building Services Piping

CAL / OSHA CCR T8 560 Subchapter 1 – Unfired Pressure Vessels – Safe Practices

L&I WAC – Boiler Law Book – Boiler and Unfired Pressure Vessel Laws

7.0 Attachments

MCAA Guide to Pressure Testing Safety

Pre-Task Plan

JHA Form

Confined Space Entry Permit

Demolition Permit

Process Safety Management

1. Purpose

1.1. The primary objective of process safety management of highly hazardous chemicals is to prevent unwanted releases of hazardous chemicals especially into locations which could expose employees and others to catastrophic releases of toxic, reactive, flammable, or explosive chemicals in various industries such as refineries, manufacturing, and laboratory facilities.

1.2. An effective process safety management policy requires a systematic approach to evaluating the whole process. Using this approach, the process design, process technology, operational and maintenance activities and procedures, non-routine activities and procedures, emergency preparedness plans and procedures, training policies, and other elements which impact the process are all considered in the evaluation. The various lines of defense that have been incorporated into the design and operation of the process to prevent or mitigate the release of hazardous chemicals need to be evaluated and strengthened to assure their effectiveness at each level. Process safety management is the proactive identification, evaluation and mitigation or prevention of chemical releases that could occur as a result of failures in process, procedures or equipment.

2. Scope

2.1. BNBuilders will work at times in facilities where processes which contain quantities of toxic or reactive High Hazardous Chemicals "HHC". The contract employer shall advise the employer of any unique hazards presented by the contract employer's work, or of any hazards found by the contract employer's work. A List of Highly Hazardous Chemicals, Toxics and Reactive can be found in OSHA 1910.119 App A.

2.2. Exceptions

2.3. This policy does not apply to retail facilities, normally unoccupied remote facilities and oil or gas well drilling or servicing activities. Hydrocarbon fuels used solely for workplace consumption as a fuel are not covered, if such fuels are not part of a process containing another HHC covered by the standard.

3. Responsibility

3.1. Contractors

3.2. Identifies responsibilities of work site employer and contract employers with respect to contract employees involved in maintenance, repair, turnaround, major renovation or specialty work, on or near covered processes. Contract employers are required to train their employees to safely perform their jobs, and document that employees received and understood training, and assure that contract employees know about potential fire, explosion or toxic release hazards related to his/her job and the work site employer's emergency action plan, assure that employees follow safety rules of the facility, and advise the work site employer of hazards contract work itself poses or hazards identified by contract employees.

4. Procedure

4.1. **Process Safety Information -** Requires compilation of written Process Safety Information (PSI) including hazard information on HHC's, technology information and equipment information on covered processes.

4.2. **Employee Involvement -** Requires developing a written plan of action regarding employee participation; consulting with employees and their representatives on the conduct and development of process hazard analyses and on the development of other elements of process safety management required under the rule; providing to employees and their representatives

access to process hazard analyses and to all other information required to be developed under the rule. BNBuilders will assure that each contract employee is trained in the work practices necessary to perform his/her job.

4.3. Process Hazard Analysis - Process Hazard Analyses (PHA's) must be conducted as soon as possible for each covered process using compiled PSI in an order based on a set of required considerations. Similar to the BNBuilders JHA policy a PHA should describe the area to be worked in, the hazardous chemical processes that are of concern and the potential hazards of completing the work. The PHA should be completed by identifying/listing, in detail, preventative measures for each identified hazard.

4.4. Operating Procedures - Must be in writing and provide clear instructions for safely conducting activities involving covered process consistent with PSI; must include steps for each operating phase, operating limits, safety and health considerations and safety systems and their functions; be readily accessible to employees who work on or maintain a covered process, and be reviewed as often as necessary to assure they reflect current operating practice; and must implement safe work practices to provide for special circumstances such as lock-out/tag-out, confined space entry, opening process equipment or piping and controls over entrance to facility.

4.5. Training - Employees operating a covered process must be trained in the overview of the process and in the operating procedures addressed previously. This training must emphasize specific safety and health hazards, emergency operations and safe work practices. Initial training must occur before assignment or employers may certify that employees involved in the process have required knowledge, skills and abilities. Documented refresher training is required at least every three years.

4.6. Pre-startup Safety Review - Mandates a safety review for new facilities and significantly modified work sites to confirm that the construction and equipment of a process are in accordance with design specifications; to assure that adequate safety, operating, maintenance and emergency procedures are in place; and to assure process operator training has been completed. Also, for new facilities, the PHA must be performed and recommendations resolved and implemented before start up. Modified facilities must meet management of change requirement.

4.7. Mechanical Integrity - Requires the on-site employer to establish and implement written procedures for the ongoing integrity of process equipment particularly those components which contain and control a covered process.

4.8. Hot Work - Hot work permits must be issued for hot work operations conducted on or near a covered process. Facility or BNBuilders Hotwork Permits are required for all 'spark-producing' equipment. Work is not permitted until the Hotwork Permit is in place.

4.9. Management of Change - The work site employer must establish and implement written procedures to manage changes except "replacements in kind" to facilities that affect a covered process. The standard requires the work site employer and contract employers to inform and train their affected employees on the changes prior to start-up. Process Safety Information and Operating Procedures must be updated as necessary.

4.10. Incident Investigation - Requires employers to investigate as soon as possible (but no later than 48 hours after) incidents which did result or could reasonably have resulted in

catastrophic releases of covered chemicals. The standard calls for an investigation team, including at least one person knowledgeable in the process involved, (a contract employee when the incident involved contract work) and others with knowledge and experience to investigate and analyze the incident, and to develop a written report on the incident. Reports must be retained for five years.

4.11. **Emergency Planning and Response -** requires employers to develop and implement an emergency action plan. The emergency action plan must include procedures for handling small releases.

4.12. **Compliance Audits -** Employers are to certify that they have evaluated compliance with process safety requirements at least every three years. Prompt response to audit findings and documentation that deficiencies are corrected is required. Employers must retain the two most recent audit reports.

4.13. **Trade Secrets -** Requirements similar to trade secret provisions of the 1910.1200 Hazard Communication Standard, also apply to the PSM Standard. Employees (and employee representatives) as well as contract employers, must respect the confidentiality of trade secret information when the Process Safety Information is released to them.

5. References:

5.1. OSHA Regulations (Standards - 29 CFR) - 1910.119 - Process Safety Management of Highly Hazardous Chemicals.
5.2. OSHA Regulations (Standards - 29 CFR) - 1910.119 App A - List of Highly Hazardous Chemicals, Toxics and Reactive (Mandatory).