DEBRIS COLLECTION and MANAGEMENT SITE HAZARD ANALYSIS

Disaster debris collection and management sites pose a multitude of health and safety concerns. Hazards and exposures are a function of the unstable nature of the site, the potential of hazardous substances being present, and the type of work being performed. This hazard analysis serves as general guidance only. Each site will have its own unique hazards, all of which cannot be anticipated.

The listed hazards, risks, and accompanying general recommendations represent suggested site hazard assessment and therefore will not represent actual field hazards present at all debris collection and management sites. It is incumbent upon the responsible entity (e.g. – State, local government, private contractor, etc.) chosen to perform and/or manage this work to assure a comprehensive site specific hazard analysis is performed and that resulting recommendations are implemented.

SITE SAFETY CHECKLIST

- ☐ Conduct a job hazard analysis to identify hazards prior to beginning site work.
- ☐ Assign key personnel and alternates responsible for site safety.
- ☐ Describe risks associated with each operation conducted.
- ☐ Confirm that personnel are adequately trained to perform jobs.
- ☐ Describe the protective clothing and equipment to be worn by personnel during site operations.
- ☐ Describe needed air monitoring, personnel monitoring, and environmental sampling.
- ☐ Describe actions to be taken to mitigate existing hazards to make work environment less hazardous.

POTENTIAL HAZARDS AND GENERAL RECOMMENDATIONS

HAZARD 1: Massive piles of woody debris and other types of debris; unstable work surfaces

Risks: Traumatic, serious, or fatal injuries or illnesses can occur due to slips, trips, falls, or collapsing materials.

- **General Recommendations:**
  - Ensure that surfaces are as stable as possible.
  - Ensure scaffolding is erected on a stable surface; anchor scaffolding to a structure capable of withstanding the lateral forces generated.
  - Ensure workers have ANSI approved safety footwear with slip resistant soles. Consider drop and roll over hazards as well as puncture hazards.
  - Site personnel to be observant of changes in walking surfaces.

HAZARD 2: Hazardous noise

Risks: Communication and possible noise induced hearing loss.

- **General Recommendations:**
  - Monitor noise levels. If 8-hour time-weighted average exposures are 85 decibels (dB) or more, a Hearing Conservation Plan is needed.
  - Try engineering out workplace noise by isolating the equipment, reduce the equipment vibration, or installing sound barriers.
  - Consider hearing protection devices are used whenever noisy equipment (e.g., large trucks, grinding equipment, loaders, generators, large motors, etc.) is used.

HAZARD 3: Breathing dust containing fine airborne particles and gases generated through diesel exhaust fumes, smoke, ash, and road dust

Risks: Irritation of eye, nose, throat, and lung.

- **General Recommendations:**
  - Workers should be protected from breathing airborne contaminants as determined through the site's analysis of respiratory hazards.
  - Respiratory protection: determine respirator type, as needed, through site specific hazard analysis.
  - Respirators must fit properly to protect workers.

- Dust concentrations in the air should be appropriately monitored.
- Stay upwind of dust generating activities.
- Maintain low speeds on construction equipment to keep dust down.
- Airborne dust may be suppressed by application of water based mist.

HAZARD 4: Heat stress from working in a hot, humid climate

Risks: Significant fluid loss can progress to clinical dehydration, raised core body temperature, impaired judgment, disorientation, fatigue, muscle cramping, resulting in heat stroke.

- **General Recommendations:**
  - Adjust work schedules, rotate personnel, and add additional personnel if needed.
  - Replenish fluids (e.g. – water, electrolytes) as needed.
  - Consider personnel and environmental monitoring plans.
  - Know the warning signs of heat related illnesses.
  - Provide shelter for personnel in shaded areas.
  - Where possible, block out sun or other direct sources of heat from fixed work locations.
  - Prevent sun related overexposure to skin by using a sunscreen lotion with a significant sun protection factor (SPF) of 15 or greater.

HAZARD 5: Cold stress from working in a cold, wet climate

Risks: This allows exposed skin and the extremities to cool rapidly and increases the risk of frostbite and hypothermia.

- **General Recommendations:**
  - Get into heated shelter as necessary to maintain body temperature.
  - Replace wet clothing immediately.
  - Drink warm fluids often.
  - Wear adequate clothing to reduce threat of cold stress.
  - Know the signs of cold stress.

HAZARD 6: Carbon monoxide risk from heaters, gasoline or propane-powered generators, or heavy machinery

Risks: Headache, dizziness, drowsiness, or nausea. This may progress to vomiting, loss of consciousness, and collapse. Coma or death may occur under prolonged or high exposures.

- **General Recommendations:**
  - Use CO warning sensors when using or working around combustion sources since CO has no warning properties. CO is a colorless and odorless gas.
  - Shut off equipment or machinery immediately if symptoms of exposure appear and immediately go to a fresh air source or location.

> **Warning!** Do not use gasoline generators or portable heaters in confined spaces or poorly ventilated areas.

HAZARD 7: Work zone traffic hazards

Risks: Traumatic or fatal injuries due to failure of or improper use of equipment or workers being struck by moving equipment.

- **General Recommendations:**
  - Establish a traffic control plan for motorists and pedestrians.
  - Use standard highway signs and control devices to instruct drivers.
  - Use barriers (concrete, water, sand, collapsible barriers, crash cushions, and truck-mounted attenuators) to limit motorist intrusion into the work zone.
  - High visibility safety garments should be provided for those providing temporary traffic control (class 2 or 3) and workers on foot (class 1, 2, or 3).
  - Seat belts and rollover protection should be used on equipment and vehicles as stated by the manufacturer.
  - Workers on foot, equipment operators, and drivers in internal work zones need to know the routes construction vehicles will use.
  - Be mindful of limited visibility (e.g. – blind spots) which heavy machine operators have while driving machines at the work site.
  - Maintain safe driving distances, avoid using cell phones while driving, and obey all traffic laws.

HAZARD 8: Eye, face, hand, and head injuries from flying debris; wood particles

Risks: Traumatic injuries, ranging from minor injuries requiring first aid to serious eye injuries, even disabling or fatal traumatic injuries.

- **General Recommendations:**
  - Only use protective eyewear, face shields, and protective head wear that are ANSI approved.
  - Educate workers regarding safe work procedures before beginning work.
  - Provide workers with a full array of personal protective equipment, including hard hats, safety shoes, eyeglasses, and work gloves.
  - Ensure that workers do not walk under or through areas where cranes and other heavy equipment are being used to lift objects.
  - Proper eye protection (e.g. - goggles or safety glasses).
  - As a minimum requirement use safety glasses with side shields by all site workers. Faceshields are not a substitute for safety glasses.
  - Use safety goggles for protection from fine dust particles rather than using regular prescription eyeglasses.
  - Choose hand protection to fit the hazards determined through the hazard analysis (e.g. – laceration hazards, need for gripping, need for dexterity, etc.).
  - Stay outside the 300 foot safety zone while a chipper is in operation.
  - Check the kick-back device on chainsaws before use.

HAZARD 9: Use of various types of heavy equipment, including cranes, bucket trucks, skid-steer loaders, etc.

Risks: Traumatic injury, including serious and fatal injuries, due to failure of improper use of equipment, or workers being struck by moving equipment.

- **General Recommendations:**
  - Wear safety vests. Safety orange vests with reflective stripes are recommended.
  - Ensure operators are aware of the activities around them to protect workers on foot from being struck by moving equipment.
  - Ensure that workers do not walk under or through areas where cranes and other heavy equipment are being used to lift objects.
  - Ensure that workers do not climb onto or ride loads being lifted or moved.
  - Ensure that all equipment warning devices are working (flashers, strobes, back-up alarms).
  - Machinery is to be inspected by a qualified worker before each use, per OSHA requirements.
  - Stay at lease 20 feet beyond maximum equipment swing radius or movement areas. Assign spotters as needed.
  - Do not exceed the load capacity of cranes and other lifting equipment.

HAZARD 10: Chemicals, flammables and combustibles

Risks: Traumatic, serious, or fatal injuries or illnesses can occur due to inhalational, dermal, and fire hazards.

- **General Recommendations:**
  - Ensure that hazardous waste (batteries, PVC piping, solvents, pesticides, and compressed gas cylinders, etc.) are properly separated from “burnable” trash.
  - Utilize GFCI for any extension cords or power tools.
  - Store gasoline in an approved container not to exceed 5-gallon capacity.
  - Allow gasoline power tools to cool down prior to refueling.
  - Ensure containers are bonded and grounded during dispensing.
  - Ensure adequate fire extinguishers are available at work sites and on work vehicles.
  - Maintain a fire watch during all fire-related activities until material has been extinguished and cooled.
  - If possible, avoid establishing debris management sites where there is a limited public water supply, lack of 911 service, or delays in fire department response time.

HAZARD 11: Isolated work areas and sanitation

Risks: Remote locations delay response times from emergency providers. Precaution can reduce the severity of the event.

- **General Recommendations:**
  - Water-borne disease:
    - Always wash your hands.
    - Use hand sanitizers frequently.
    - Exercise good housekeeping.
    - Only drink from proven potable water sources.
  - Blood-borne disease:
    - Use latex or similar type gloves when handling remains.
    - Replace gloves if punctured or torn.
    - Receive appropriate vaccinations (Hepatitis A, B, Tetanus, Diphtheria, etc).
    - Avoid standing water.
    - Observe universal precautions.
  - Food-borne disease:
    - Identify and dispose of food that may not be safe to eat.
    - Handle food properly.
    - Keep a supply of water and food on hand.
    - Rest when off duty.
  - Emergencies:
    - Know location and phone numbers of nearest hospital, doctor, and police.
    - Carry a first-aid kit.
    - Know the address or nearest cross-road of work site to notify emergency responders.

HAZARD 12: Insects, animals, reptiles, and plants

Risks: Traumatic, serious, or fatal injuries or illnesses can occur due to insect or animal bites.

- **General Recommendations:**
  - Protection from plants:
    - Be alert of poisonous plants.
    - Use barrier creams if available.
    - Wash affected area after contact.
  - Protection from wild or stray animals:
    - Avoid animal habitats (infested areas, rodent burrows, and nests).
    - Do not attempt to take custody of animals unless properly trained.
    - Avoid wild or stray animals. Assume all animals are rabid. Call local authorities to handle animals.
    - Dispose of animal carcasses according to local guidelines.
  - Protection from insects (mosquitoes, bees, spiders, fire ants, etc):
    - Wear appropriate clothing (long pants, socks, long sleeved shirts, etc).
    - Avoid infested areas.
    - Use insect repellents that contain DEET or Picaridin, when necessary.
  - Protection from snakes:
    - Assume all snakes are poisonous. Be on alert for snakes that may be hiding in unusual places after flooding.
    - Seek immediate medical attention if you are bitten.
    - Try to identify the snake so that if it is poisonous you can be given the correct anti-venom.

HAZARD 13: Power lines and gas lines

Risks: Traumatic, serious, or fatal injuries or illnesses can occur due to electrocution.

- **General Recommendations:**
  - Treat all power lines and cables as energized until proven otherwise. De-energized lines can be energized by a secondary power sources such as a backup generator.
  - Use appropriately grounded low voltage equipment.
  - Do not approach detected gas leaks.

- Contact utilities (e.g. – utility locate service) for buried power line location.
- Stay at least 10 feet away from live overhead power lines.
- Get the owner or operator of the lines to de-energize and ground lines when working near them.
- Use non-conductive wood or fiberglass ladders when working near power lines.
- Keep area burn piles, observation areas, and areas where heavy equipment is used away from power lines and other electrical equipment.

HAZARD 14: Debris towers

Risks: Traumatic, serious, or fatal injuries or illnesses can occur due to falls from elevated surfaces.

- **General Recommendations:**
  - Inspect scaffolds and scaffold components for defects before each work shift and after any incident which could affect structural integrity.
  - Provide adequate buffer zones around the tower.
  - Anchor the scaffold to prevent displacement from wind with guide wires
  - Do not exceed load capacity of the scaffold.
  - Footing of the tower must be level, sound, rigid, and capable of supporting the load without settling or displacement.
  - A standard guardrail (top, mid, toe) and handrail system must be installed along all open sides.
  - Provide appropriate ventilation if a heating system is present.
  - No smoking.
  - Use established construction guidance (e.g. – US Army Corps of Engineers).

HAZARD 15: Aerial lifts and scissor lifts

Risks: Traumatic, serious, or fatal injuries or illnesses can occur due to falls, tip-overs, and pinch points.

- **General Recommendations:**
  - Only trained and authorized people may operate the lift.
  - Check for overhead objects before use.
  - Stay far from debris piles, drop-offs, and floor openings.
  - Never use equipment near electric lines unless the lines are de-energized or adequate clearance is maintained.
  - Refuel tanks only when the machine is off.
  - Elevate the lift only when it is on a firm and level surface.
  - Never drive the lift when in the extended position.

HAZARD 16: Severe weather

Risks: Traumatic, serious, or fatal injuries or illnesses can occur due to hypothermia, hyperthermia, and lightning strikes.

- **General Recommendations:**
  - Monitor local weather conditions regularly.
  - Recognize the signs of an oncoming thunder and lighting storm and seek shelter.
  - Avoid small sheds, wooded areas, metal fences and open areas.

You can help prevent workplace injuries and illnesses by looking at your workplace operations, establishing proper job procedures, and ensuring that all employees are trained properly. One of the best ways to determine and establish proper work procedures is to conduct a job hazard analysis. A job hazard analysis is a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. Ideally, after you identify uncontrolled hazards, you will take steps to eliminate or reduce them to an acceptable risk level.

A job hazard analysis can be conducted on many jobs in your workplace. Priority should go to the following types of jobs:

- Jobs with the highest injury or illness rates;
- Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents;
- Jobs in which one simple human error could lead to a severe accident or injury;
- Jobs that are new to your operation or have undergone changes in processes and procedures;
- Jobs that are complex enough to require written instructions.