| This template is offered to aid contractors in developing their own JHA/AHAs for ORNL construction projects by providing the typical JHA/AHA Hazard and Control detail expected for construction related hazards. This is intended as an example of acceptable content but is not a replacement for contractor developed JHAs/AHAs. The Activity column in this template refers to the common “activity” for ease of reference but contractor submitted JHAs/AHAs should detail the specific task/activity in the sequence of construction that is typical of the Activity column in an AHA. Contractors may borrow from this JHA/AHA language for common construction hazards but should further customize the content specific to their project and task. This template is also not a required format if a contractor already has an acceptable AHA/JHA format. This template does not preclude any regulatory or contractual requirements. | | |
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| Activity (insert specific job steps) | Hazard | Controls |
| **Emergencies / General Site Conditions** |  |  |
| Site Emergencies | * Construction Site Emergency * ORNL Site - Emergency Actions | * To report any emergency, dial (865) 576-4577 or pull a nearby fire alarm.   NOTE: Dialing 911 from a cellular phone will not contact the ORNL LSS. It will contact outside agencies based on user location. Dialing 911 on any ORNL land-based line will contact LSS directly.   * To respond to an ORNL site emergency - when a standard alerting tone is heard or when directed by ORNL Personnel: * Stop working * Listen carefully * Follow announcement instructions from the public address system and/or the Site Safety Representative or Supervisor. * Perform shutdown procedures only if your safety will not be compromised. * If directed to take cover, proceed to a suitable cover area on the site or proceed as directed by supervisor or ORNL personnel. * If directed to shelter in place, immediately isolate yourself from the outside environment by shutting down any HVAC systems and closing and sealing doors and windows within the facility you are isolating in. * Follow directions of supervisor, lab-wide announcements, or emergency response team. * If directed to evacuate, immediately evacuate through the nearest exit. Proceed to the designated assembly point nearest to the construction site. |
| Poor Housekeeping | * Clutter * Slip Surfaces * Protruding Objects * Sharp Objects | * Keep all areas and walking/working surfaces neat and clear of unnecessary materials, tools, debris, etc. * Keep materials neatly staged in their designated locations so as not to create tripping hazards. * Pick up nails and any other objects that cause injury to personnel or damage to vehicles. Remove or bend down nails in material that will be reused or loaded by hand. * Place trash in provided and marked trash receptacles. * Place debris in proper refuge containers daily.   + Accumulated combustible material shall be removed daily. |
| Site Control Signs and Barricades | * Hazard awareness * Unauthorized entry | * Signs and barricades will be used to keep unauthorized persons out of the construction areas. “Construction Area” signs. Additional signs (i.e. warning, caution, danger) will be posted in all work areas where specific hazards are identified (e.g., noise, overhead hazard, asbestos, etc.). |
| **Accessing Worksite / Transiting Worksite** |  |  |
| Personnel unfamiliar with site | * Personnel unfamiliar with site hazards and conditions * New workers | * All personnel shall review and acknowledge comprehension of applicable JHA’s / AHA’s and applicable safety procedures before starting any work. * Personnel shall comply with all site requirements, postings, and barriers. * All personnel shall be familiar with site emergency alarms and evacuation routes. * Accountability procedures will be communicated to all site personnel * Planned activities for the day and the associated hazards will be presented at the daily safety briefings. Those who arrive after the pre-job brief shall receive a briefing before starting work. * Hazard Communication shall be provided to all affected employees for all chemicals used onsite. * Injury, illness, or near-miss events shall be reported to the Site Supervisor or Safety Representative no matter how minor. * Contacting the Lab Shift Superintendent (LSS)at (865) 576-4577in the event of an emergency, spill, security event or any event requiring ORNL response to the site. |
| Unauthorized Visitors | * Unauthorized personnel * Unexpected visitors * Site Intruders | * Site personnel shall be alert to unfamiliar individuals on site. If an unescorted stranger enters the project area, notify your Site Supervisor or Safety Representative. Direct individual/s to proper location. * Access to construction areas are limited to personnel meeting the requirements for PPE, equipment and training. * Signs, flags and/or barricades shall be erected around the project site, storage areas, and hazardous work areas as required to prevent unauthorized entry. * Visitors to the site shall report to site supervision or safety prior to proceeding into the work area and may need to sign a visitor log. The Site Supervisor, Safety Representative or designee shall brief all visitors on the hazards present and the safety measures to be followed during their visit. |
| **Environmental / Biological Concerns** |  |  |
| Erosion | * Sediment runoff | * Silt fence shall be installed and maintained as required. * A vegetative buffer shall be left between exposed soil and drainage ditches (whenever possible) * Equipment operators shall inspect their equipment for leaks and loose fittings prior to and during their shift. Report all problems to supervision immediately. * When work is completed in disturbed soil area, seed and straw as soon as feasible to help minimize the potential for soil runoff during rain events. * Check storm water discharges after a rain event and augment erosion controls as needed. |
| Lighting | * Inadequate illumination * Limited visibility | * Work area illumination shall meet general construction lighting requirement of 5 foot candles in the active work area * Parking area and exterior walkway lighting shall be a minimum of 2 foot candles. * Be aware of seasonal changes in available daylight and adjust accordingly * Provide additional lighting (portable lighting) as needed. Flashlights and cellular phone lights are not acceptable beyond temporary use. |
| Uncontained Spills | * Spills * Releases * Los of | * Report all spills to the Safety Representative, Site Supervisor and or LSS immediately. * A spill kit will be available on site in the event of an unforeseen spill that could potentially damage the environment. No work shall endanger the environment.   + If a spill occurs, contain the area if it can be done safely, and make impacted personnel aware. Contact LSS in the event of a spill. The LSS will summon necessary ORNL support for spill response. |
| Wildlife and Insects | * Stings * Animal Bites * Insect Bites | * Avoid walking in areas known to harbor snakes and exercise caution when picking up or moving items staged on the ground. * If a snake is encountered, others may be present. The best approach is to slowly leave the area by retracing your footsteps. * If bitten by a snake, the wound should be washed and the bitten area immobilized and kept lower than the heart, if possible. * The project superintendent shall inform all personnel regarding the potential of pest hazards so that all personnel will be made aware of potential exposure to insect pests such as chiggers, ticks, mosquito’s, spiders, bees/wasps, fire ants, etc. * Fire ant hills will be flagged as they are identified to prevent workers from inadvertently crossing their path. Personnel shall pay particular attention to identify and avoid fire ant habitats. * Superintendents will ensure insect repellant is available for all employees, as needed. * Long sleeves and long pants with taped ankles and wrists will help prevent insects from getting further onto skin. |
| Toxic Plants | * Poisonous Plants * Allergic reactions | * When working in areas with poisonous plants wear long sleeved shirt and avoid exposure to bare skin. * Wash any areas that may have been exposed to poisonous plants with soap and water immediately following possible exposure. |
| Temperature Extremes - Heat | * Heat Stress | * Workers may be exposed to hot work environments. Therefore, symptoms of heat stress will be highlighted in toolbox meetings, pre-job activities, and work planning, as appropriate. * Personnel will be trained in recognizing signs and symptoms of heat stress. * The Supervisor / Safety Representative or designee will monitor site and weather conditions and advise accordingly. * Based on heat levels, work/rest regimes shall be administered and adhered to. * Personnel will be encouraged to drink sufficient fluids throughout the entire workday and at home. * Avoid diuretics, i.e. caffeinated beverages and eat breakfast/ lunch each day. * Take breaks in shaded or air-conditioned areas. * Use of sunscreen and/or lightweight long-sleeved shirts is encouraged to protect against sunburn and skin damage. |
| Temperature Extremes - Cold | * Cold Stress | * Workers may be exposed to cold work environments. Therefore, symptoms of cold stress will be highlighted in toolbox meetings, pre-job activities, and work planning, as appropriate. * Personnel will be trained in recognizing signs and symptoms of cold stress. * Dress in layers of weather relevant clothing, wear appropriate head and hand protection * If clothing becomes wet, change into dry clothing as soon as possible * Take breaks in warm locations (Break Trailer) as needed * The Supervisor / Safety Representative or designee will monitor site and weather conditions and advise accordingly. * Be aware that additional cold weather clothing may restrict normal movement and visibility. Use additional caution near moving equipment and power tools. |
| Weather | * Inclement Weather * Lightning * Wind | * All personnel will observe weather conditions and follow the instructions provided with warnings. * The Safety Representative or Site Supervisor will monitor the work area when lightning is within 10 miles of the work site and when an “all clear” is given. (Outdoor activities shall cease when lightning is within sight or as directed otherwise). * The Safety Representative or Site Supervisor will direct field personnel to suspend all outdoor work activities and personnel are required to take cover in designated areas or permanent structures. * The Safety Representative or Site Supervisor will determine when workers need to take shelter away from the work site by being alert to changing and threatening weather conditions such as heavy rain, strong winds, and tornado watches/warnings. * The Safety Representative or Site Supervisor will notify field personnel when the “all clear” is given and conditions are “reasonably” safe to return to work. * A structure for weather related shelter shall be designated and communicated to workers each day. |
| Slips, trips and falls | * Slippery Surfaces * Trip Hazards * Falls from equipment | * Determine the best access route before transporting equipment or material. * Continually inspect the work area for slip, trip and fall hazards and be aware of the changes in surfaces and conditions that may occur. If possible, fix and/or avoid “high-risk” areas. * Avoid walking across unsafe terrain unless necessary. When necessary, due to work activity, extreme care shall be taken to ensure proper footing. * Do not step from one piece of equipment to another. Get down from one piece of equipment and then board another from the ground. * When standing or climbing on elevated surfaces such as equipment ladders, decks, platforms or steps, always maintain 3 points of contact * Ensure boots are free of oil, mud, and grease * Implement clean as you go practices for all work. |
| Bodily Fluids | * Bloodborne Pathogens | * Biohazard kit shall be on site for use in the event of injury involving body fluids. * Designated response personnel shall have Bloodborne Pathogen training. |
| **Chemical Exposure / Fire / Spills (General)** |  |  |
| Chemical Exposure | * Inhalation * Absorption * Ingestion * Eye-contact * Skin contact | * All chemical products that are used on site must have a Safety Data Sheet (SDS) available, the appropriate PPE available, and Industrial Hygiene Monitoring based on Safety Representative recommendations. * All chemicals brought to the site must be evaluated by the Safety Representative regarding use, SDS review, and addition to the ORNL Hazardous Materials Management Information System (HMMIS). * All exposed employees will be trained by the employer on the hazards and will follow the exposure controls in the SDS for the material. * Appropriate PPE shall be utilized when working with chemicals when specified in the SDS such as hand protection (gloves) / arm & skin protection (long sleeves / apron) / eye protection (splash proof goggles), and respiratory protection. * Engineering controls, monitoring plans, and appropriate PPE shall be used when working with chemicals as specified by the SDS and/or Safety Representative. * All containers of hazardous materials shall be appropriately marked / * labeled, including secondary containers. |
| Chemical Fire / Explosion | * Fire / Explosions | * In case of fire, the Lab Shift Superintendent (865) 576-4577, Site Supervisor, and Safety Representative shall be notified immediately. * Any cutting or welding shall require the use of a Hot Work Permit. * Fuel not in a vehicle or motorized device, shall be in an approved safety cans with safety cap, flash arrestor, and appropriate label. * Turn off equipment before refueling and let cool down per manufacturer’s   instructions.   * Smoking is allowed only in designated areas. * Personnel will have “Hands On” training in the use of fire extinguishers as required. * Spill kits shall be available in immediate area. |
| **Material Handling** |  |  |
| Unload / Load Material   * Using Forklift * Using Pallet Jack | * Struck by * Unstable load * Falling load * Damage to load | * Only ONE signal person / spotter gives signals/instructions to the operator. * Avoid pulling loads off of or out of trailers with tow straps, cables or chains. * Know the weight of the item/load to be lifted prior to lifting. Refer to labels, tags, manifests, etc. * Avoid awkward or restricted work areas. * Do NOT linger in overhead doorways. * Use side doors for all other material / personnel movement. * When a forklift truck is equipped with an attachment, the rated   capacity of the truck/attachment combination shall be established by the truck manufacturer. |
| Manual Material Handling | * Ergonomic Concerns * Repetitive Motion * Potential back injury * Muscle Strains * MSD’s: Injuries such as Carpel Tunnel Syndrome and tendonitis, that affect muscles, nerves, tendons, ligaments, joints or spinal discs * Vibration | * Use proper lifting techniques * Avoid bending and twisting at the same time * Bend at the hips and not at the waist * Squat/Stoop and lift with the legs * Push items/objects instead of pulling * Use additional personnel or mechanical lifting device to handle objects   over 50 lbs.  **Personnel shall become familiar with musculoskeletal disorders (MSD) by recognizing the sign and symptoms, including:**   * Pain in wrists, shoulders, forearms, knees * Back or neck pain * Pain, tingling or numbness in hands or feet * Shooting or stabbing pains in arms or legs * Painful joints and stiffness * To reduce and/or eliminate cumulative trauma disorders personnel will be encouraged to find alternative methods for performing repetitive motion tasks such as change of position, using different hand positions, use of PPE, using a support, and good posture. * The use of job/task rotation may also be used to minimize these hazards. |
| Manual Material Handling | * Injuries caused by improper manual material handling | * Consider size, shape, and weight of the object. Lifts greater than 50 lbs. require assistance or the aid of mechanical equipment. * Use safe lifting techniques such as keeping back straight, feet placed for balance, bending at the knees, keeping the load close and low to the body, lifting smoothly, and not twisting the torso. * Squat/stoop and lift with the legs. * Hands, gloves and the object to be lifted should be free of dirt or grease that could prevent a firm grip whenever possible. * Always evaluate pinch hazards prior to handling material or any other activity that involves possible pinch point hazards. * Watched for fixed objects such as door openings, doorknobs, or furniture that may cause injury during movement of an object through those areas. |
| Manual Material Handling | * Hand Injuries (abrasions, cuts, lacerations, etc.) | * Be aware of surroundings, moving parts, and pinch points. * Proper gloves are required to be worn during material handling, as practical. * Be aware of the presence of rough or jagged edges that are typically exposed on materials such as when cutting sheet metal and piping or working with rebar, metal mesh, and/or wire ties. * Do not hold utility knives near the blade. Always cut away from your body and opposite hand when using a utility knife. Ensure the blade is sharp and not rusty before each use. (Recommend self-retracting utility knives) |
| Staging / Storing Material | * Struck by * Muscle strain / sprain * Cut/laceration/contusion | * Place dunnage first (on ground / between layers), then position/place load on top * Follow any/all stacking requirements / directions on boxes, equipment, etc. (Do NOT over-stack), ensure items are stable before leaving the area, etc. |
| **Hand Tool / Power Tool Use - General** |  |  |
| Hand Tools and Knives | * Improper training * Damaged tool * Contusion/struck by * Cut, laceration * Eye injury | * Use tool for its intended purpose only – screwdrivers are not chisels, etc. * Appropriate PPE shall be evaluated and worn during tool operations. * Do Not leave a knife laying in the open position unattended * Do Not walk with a knife in the open position * Do Not hand an open knife to another worker. Close or sheath the knife first. * Replace dull or broken blades * NEVER cut any material that is braced on any part of your body – use sawhorses or other firm, stable surfaces – ALWAYS cut away from your body * Use proper cutting techniques (proper body stance, good grip, stable footing) * Tools shall be used per manufacturer’s recommendations. * Hand tools shall be inspected daily for spalled heads, broken or cracked handles, loose heads, etc. |
| Power Tools (drills, portable band saws, circular saws, grinders, reciprocating saws, grinders, impacts, etc.)   * Corded * Battery powered | * Improper training * Damaged tool * Electric shock * Contusion/struck-by * Cut, laceration * Projectiles | * Ensure workers are trained in proper care and use of tools prior to commencing work * GFCI protection shall be required with all cord/plug power tools used on all construction work. * Obtain operator manual(s) for tool and use according to manual. Make manual available for worker reference * Tools shall be operated within their functions / limitations and shall be used only for their intended purpose * Inspect all power tools and cords prior to use –Tag and remove from service if damaged in a manner that effects safe operation * Power tools equipped with a safety guard of any type shall only be used with the guard in place and functioning properly. * Unplug tools or remove batteries before changing bits, blades, etc. * Use sawhorses or other firm stable platform to support material * Wear appropriate hand protection for the tool and the task – REVIEW the operator manual * Wear appropriate eye protection for the tool and the task – safety glasses at a minimum * Face shields are required for grinders or chop saws use * Verify tongue guards are in place AND adjusted according to user manual |
| Drilling and Cutting Techniques | * Equipment usage * Flying objects * Dust * Material Handling * General Construction | * Proper cut or drilling equipment should be used, make sure all tools used have the proper guards and accessories for the task * Check all equipment for defects and check all cords for condition. * Appropriate engineering controls shall be implemented to minimize employee exposure to silica dust when present. Controls include engineering control such as ventilation or HEPA filter vacuum, “wet methods”, and housekeeping when drilling holes or cutting into existing concrete. * If dust cannot be eliminated or methods should be considered such as administrative controls or PPE. * If PPE is deemed necessary, the employees shall be medically evaluated, fit tested, and trained to properly use approved respirators. |
| Unexpected Tool Movement | * Energized parts * Machine surge | * Disconnect power supply or battery prior to changing bits or blades. Wear gloves to protect hands from sharp blades, bits or turnings. * Properly dispose of used cutting blades or bits. * When lowering machine to cut it is possible for machine to surge forward or back rapidly. Make sure no one is in front of or behind machine when it is being lowered into the cut. |
| Extension Cord(s) | * Electric shock | * Inspect all extension cords prior to use – RED Tag and remove from service if damaged – outer jacket damaged/inner conductors exposed, missing ground, etc. * Cord jacket must be rated for hard or extra hard usage. * Inspect all extension cords quarterly by a qualified individual. * Route cords to avoid sharp edges, doorways, water or other obstacles. * Protect cords running across roads / access path(s) – use cord covers at roadway. * GFCI protection will be used on all cords / tools. * Avoid connecting multiple cords (daisy-chaining) together. |
| **Respiratory Protection** |  |  |
| Activities Requiring Respirator Use  (Silica, Welding, Chemical exposure) | * Untrained * Unqualified (medically) * Improper fit * Wrong respirator type | * Follow contractor Respiratory Protection Program / Procedure. * Workers required to wear respirators shall have current Respiratory Medical Certification (within 1 year), fit test for respirator used (1/2 face, full face) and training in proper care and use of respirators. * Respirator type and cartridge selection will align with the associated hazard and task. |
| Silica Exposure | * Drilling into concrete * Saw Cutting / chipping concrete * Core Drilling / Brushing / Grinding * Sweeping / Clean-up Silica | * Competent Person for Silica will assess activities prior to commencing work * Competent Person for silica will prepare written exposure control plan for each specific task (anchors, demo, saw cutting, grouting, etc.) * Implement control measures when working with concrete/silica * Engineering controls include: Manufactured HEPA vacuum driven collar system that surrounds the drill bit and captures the dust as it is produced. Integral water delivery system that minimized release of visible dust * Vacuum wet/slurry after saw-cutting / core drilling to prevent slip / fall hazard * Wear respiratory protection in accordance with requirements * Do not dry sweep or use compressed air or blowers to clean up silica containing dusts |
| **Heavy Equipment / Trucks / Traffic Control** |  |  |
| Unskilled Operators | * Untrained operator | * Only qualified operators shall operate heavy equipment and skilled tools. * Proof of qualifications shall be documented and available for review. |
| General Operator Safety | * Unsafe equipment operations | * Seat belts and other applicable operator restraints worn at all times of operation when provided. * General cell phone use is prohibited while operating equipment. * Extreme caution shall be used when approaching intersections, corners, or other areas where visibility is limited or obstructed. * Keep equipment and pedestrian paths separate where possible. * Evaluate overhead obstructions for vehicles/equipment greater than 8’ in height.   Appropriate signs will identify all locations where trucks or motorized vehicles will be entering/ leaving the work site. |
| Traffic control through work areas / Flaggers | * Untrained flaggers * Hazards to flag person * Hazards to public and workers * Hazardous vehicle drivers | * Traffic flagging procedures shall be in accordance with the Federal Highway Administration's “*Manual on Uniform Traffic Control Devices for Streets and Highways*.” * Flagger chief duties are:   + Guide traffic safely through work areas   + Protect fellow workers from traffic   + Prevent unreasonable delays for road users, and   + Answer motorists’ questions politely and knowledgeably. * Always remain standing and face oncoming traffic. * Do not stand in the path of an approaching vehicle. * Stand where you will always be highly visible. Do not stand in shadows or near parked vehicles or equipment that might hide you from approaching drivers. * When two or more flaggers are working together (one on each end of the work area), they should always be able to see each other or have two-way radios for communication. |
| Mobilizing Equipment/Vehicles | * Struck by (struck by equipment being loaded or unloaded and delivery trucks) * Caught between * Run over * Crushed * Pinch Points * Sharp edges, projecting or protruding edges, lacerations | * All motorized-wheeled and track equipment is subject to safety inspections prior to entry into the site. (Contact RADCON to arrange radiological survey prior to use on site as required.) * Prior to initial operation all motorized-wheeled and track equipment shall be inspected, and inspection documented. * For motorized-wheeled and track equipment requiring an inspection (vehicles greater than one ton). The inspection shall be recorded on the supplied inspection sheet and the sheet signed by the device operator. * All motorized-wheeled and track equipment shall be operated by a qualified operator, and shall be in good working condition without cooling, hydraulic, lubricant, and fuel leaks. * All motorized-wheeled and track work equipment shall have required and properly inspected fire extinguishers. * All stationary combustion engines will have fire extinguishers located adjacent to the work area (within 10 feet). All mobile equipment (i.e. excavators, forklifts, etc.,) will have fire extinguishers mounted within the user compartment. Extreme caution will be taken when refueling vehicles and equipment. Equipment being fueled will be grounded to the fuel source. * Spotters will be used when loading or unloading equipment on/off trailers. Equipment operators shall follow instruction from the spotter. * Personnel will be cautioned regarding mobile equipment in the area being loaded or unloaded. Spotters will not position themselves on either side of trailer while loading/unloading and will remain clear of fall zone until equipment comes to final rest. * Personnel shall not walk behind equipment while it is running. * Driver/Operators will be made aware of personnel in the area and cautioned to travel at posted speed limits, no greater than 25 mph on unpaved surfaces. * Personnel on the ground will establish visual contact with vehicle drivers before approaching or crossing the path of the equipment/vehicle. * Personnel shall wear a minimum of Type II-high visibility vests. * Equipment parking brake shall be set when exiting equipment. * Trailers shall be on a level place with wheels chocked before disconnecting. * Ensure hands, arms, legs, feet are not placed in between pinch/crush points * Personnel shall be aware of sharp edges and corners |
| Equipment Operations | * Defective Equipment * Poorly Maintained Equipment * Contaminated Equipment | * All equipment is subject to radiological surveys prior to entry and exit from the facility as determined by the responsible radiological control staff. * All equipment is subject to safety inspections prior to entry into the site. * All equipment shall be operated by a qualified operator, in good repair without cooling, hydraulic, lubricant, or fuel leaks. * Seat belts and other applicable operator restraints shall be worn at all times during operation. * Prior to operation, all equipment shall be inspected daily or as otherwise specified in the owner manual. * For equipment requiring documented inspection, the inspection shall be recorded on the supplied inspections sheet. Inspection records be kept onsite for review as requested. * All equipment shall have required and properly inspected fire extinguishers * Extreme caution will be taken when refueling vehicles and equipment. * Before refueling equipment, a suitable cool down time shall be observed. * When leaving equipment unattended make sure equipment is in gear with engine shut off and parking brake engaged. * Chock wheel of trailers, generators, compressors, etc. that are parked on grades |
| Heavy Truck Operations | * Truck Turnover * Contact with Overhead Lines * Mechanical failure * Difficult road conditions and/or excessive speed, head-on collisions, etc., | * Driver will pre-inspect equipment prior to use. If any equipment fails the pre-inspection, notify your supervisor and remove the equipment from service for repairs. * Do not overload dump trucks. * Driver will preview loading and dumping areas to identify overhead power lines and other obstructions. * Recognize surface areas hazardous to dumping, such as uneven and sloping surfaces or poorly compacted fill. Dumping loads while located on hazardous surface areas may result in vehicle tip-over. * Be aware of blind spots when backing equipment. * Cones will be placed at the edge of pavement to mark all overhead hazards in the work zone. * A designated spotter in a high visibility reflective vest will be used to guide driver into the designated loading area and dumping area. * An additional spotter will be placed at identified overhead hazards located in the work zone while operations are being conducted. * All dump trucks shall be equipped with a holding device to prevent accidental lowering of the dump body while maintenance or inspection work is being done. * All hoist levers shall be secured to prevent accidental starting or tripping of the mechanism. * All off-highway end-dump trucks shall be equipped with a means (plainly visible from the operator's position while looking ahead) to determine whether the dump box is lowered. * Trip handles for tailgates on all dump trucks shall be arranged to keep the operator in the clear. * If a signal person or spotter is not used, drivers will walk behind their vehicle to view the area for possible hazards prior to backing. |
| Equipment Rollover | * Equipment rollover and Unsecure Loads | * Seat belts and other applicable operator restraints shall be worn at all times of operation when provided. * Equipment shall be equipped with Rollover Protective Structure (ROPs) as required. * Do not side load equipment onto trailers. * All personnel shall be kept away from fall zones and pinch points of equipment being loaded or unloaded. * Trailers shall be level as possible, especially from side to side, when loading or unloading equipment. * Stop and reposition the trailer and/or equipment as often as necessary to obtain the safest load/unload condition. |
| Removing Loads with Forklift | * Loss of load * Struck by load * Prohibited Practices | * Workers shall be alert for containers or other items that may have become unsecured during transport. * Maintain a safe distance from edge of trailer bed when items are on trailer. * When removing load from vendors vehicle ensure forks are properly centered under the load prior to lifting. * If the load is such that uneven terrain may cause it to shift on the forks, then the load will be strapped to the high lift boom. * Riding on forks or with palletized material is strictly prohibited. * Rigging from the forks of lifting devices is strictly prohibited. |
| Securing / Unsecuring Loads | * Securing equipment during transport (spontaneous release causing struck by injury) | * Do not position your body over the tie downs or hooks when loosening load. * Use caution when loosening tie down straps to avoid recoil due to sudden release of tension. * Ensure that other personnel are not positioned in the fly or fall zones of tie-down devices and loaded items while removing or securing them. * Inspect flatbed before loading equipment. Check all bolts on the flatbed to ensure there is no rust, cracking or looseness of bolts on any of the support beams and posts, if equipped. Check the lug nuts on tires to ensure a tight fit. Check that the tires are properly inflated. * When equipment is loaded, make sure it is placed so the weight is positioned correctly for transport. * Inspect all chains. Make sure chains are free from rust, with no cracked or broken links. * Tie down equipment at four points. Two points as close to the front as possible, one on each side. The other two points as close to the back as possible, one on each side. |
| Trailers | * Crushed between equipment, trailer and truck, or fixed object | * Equipment parking brake shall be set when exiting equipment. * Trailers shall be on a level surface with wheels chocked before disconnecting. * Ensure hands, arms, legs, feet are not placed in between pinch/crush points * Personnel shall be aware of sharp edges and corners |
| Vehicle Operations | * Driving Controls * Failing to yield * Disobeying traffic controls * Distractions * Cell phones * Fatigue | * Inspect vehicle regularly. Ensure vehicle is operating properly. Report any problems immediately. * If the vehicle is used in rough conditions, inspect it more frequently. * Consider weather, road conditions, and traffic impacts. * Obey all laws regarding operating motor vehicles. * Obey any physical or medication restrictions for operating motor vehicles. |
| Retrieving Stuck Equipment | * Pulling/pushing stuck equipment | * STOP and notify your supervisor immediately. * Assess site conditions to determine safest approach and determine safest method to push or pull stuck equipment. * Clear unnecessary personnel from the area. * All attachment devices shall be of sufficient capacity for the task. * Pulling straps and chains shall be inspected and free from defects. |
| **Excavation / Trenching** |  |  |
| Loading / Transporting / Dumping Fill | * Soil Excavation * Loaders/Haulers * Striking underground utilities * Contamination | * Dump truck operator/drivers shall remain in the cab of their trucks with the doors closed until loading is completed * Driver will preview loading and dumping areas to identify overhead power lines and other obstructions. * Recognize surface areas hazardous to dumping, such as uneven and sloping surfaces or poorly compacted fill. Dumping loads while located on hazardous surface areas may result in vehicle tip-over. * When parked, the equipment parking brake shall be set (as applicable), blades and buckets lowered to the ground, and wheels chocked as necessary to prevent movement. * Equipment operators will use designated temporary haul roads. * Dump trucks transporting debris shall be loaded so that no debris falls from the truck during transport and/or use tarps to contain debris |
| Excavation / Trenching Near Underground Utilities | * Underground Utilities | * Before any excavation/penetration is allowed a permit will be obtained. * The Excavation/Penetration permit will be on-site and will be reviewed by personnel prior to any intrusive activities. * Prior to performing excavation activities, the Site Supervisor will coordinate the surveying of the area for underground utilities. * Underground utilities shall be properly marked on the ground prior to performing any excavation activities. * Personnel should walk down the area prior to performing any excavation. * Drawings should be considered a reference but should not be depended upon for exact locations of utilities and may not contain all utilities in the area. Use a spotter and proceed cautiously. Stop work and reevaluate. * Lock out and/or air gap any utilities that may come in contact with equipment prior to performing excavation work. |
|  | * Personnel unaware of hazards during excavation | * Conduct a pre-job brief for all impacted personnel. * A Competent Person shall complete the excavation permit. * Identify what to do for anticipated emergencies. * Stop work for any unexpected conditions and address concerns prior to resuming work. * Keep unnecessary personnel out of the area |
| **Aerial Lift Use** |  |  |
| Aerial Lift Use | * Equipment failure * Struck by * Falling * Overhead obstructions | * Inspect aerial lift upon arrival and daily prior to use. Document daily inspections on inspection form * Only trained and authorized personnel shall operate aerial lifts. Verify training prior to use. * All occupants shall always wear fall protection while operating aerial lifts * Do not overload basket/exceed basket capacity, keep both feet on the basket floor. Never work from mid or top rail of basket. * Review work area PRIOR to raising lift / watch for overhead obstructions * Keep a minimum of 10-feet away from energized overhead lines * Utilize spotter(s) to position/reposition aerial lift – verify path is clear of obstacles * Barricade work area below while working overhead |
| Scissor Lift Use | * Equipment failure * Struck by * Falling * Overhead obstructions | * Inspect scissors lift upon arrival and daily. Document daily inspections on inspection form * Only trained and authorized personnel shall operate scissor lifts. Verify training prior to use. * Do not overload basket/exceed basket capacity, keep both feet on the basket floor. Never work from mid or top rail of lift. * Review work area PRIOR to raising lift / watch for overhead obstructions * Utilize spotter(s) to position/reposition aerial lift – verify path is clear of obstacles * Barricade work area below while working overhead * Keep a minimum of 10-feet away from energized overhead lines |
| Personnel Basket w/ Telehandler | * Equipment failure * Struck by * Falling * Overhead obstructions | * Personnel must be tied off to man basket with appropriate PPE. * Forklift operator must be at the controls at all times while man basket is in use and if the forklift is on. * Make sure everyone is aware of pinch points and stays clear of these hazards. |
| **Ladder Use** |  |  |
| Extension Ladder – General | * Falling * Equipment failure | * Inspect ladder before using / remove from service if rungs and rails are bent, damaged, labels missing or illegible, missing rope, hardware, damaged or missing feet * Set up ladder on solid, level surface / set-up at a 4:1 slope ratio, height over distance * Extend at least 3-feet above the landing / secure ladder at the top to prevent displacement or collapse when mounting / dismounting the ladder * Keep belt buckle between the ladder rails – do not overextend / overreach * Do not exceed ladder capacity * Maintain 3 points of contact while climbing * Use a rope to raise or lower tools / material to the next level * Keep area at ladder base free and clear of material, debris, obstructions, etc. * Work facing the ladder – do not stand backwards or outside the rails –body position must remain within the plane of the ladder rails at all times for stability |
| Step Ladder - General | * Falling * Equipment failure | * Inspect ladder before using / remove from service if rungs and rails are bent, damaged, labels missing or illegible, missing hardware, bent spreader bar(s), missing feet * Use only ladders appropriate for work being performed. * All ladders found to have defects shall be tagged out of service and removed from site. * Use only type 1 or 1A ladders. * Employees shall be trained by a competent person in the following areas: 1. The nature of fall hazards in the work area 2. The correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used 3. The proper construction, use, placement, and care in handling of all stairways and ladders 4. The maximum intended load-carrying capacities of ladders used. Training shall be documented on the training attendance record. S * Set-up ladder on solid, level surface – do NOT lean against a wall or surface unless designed for this application * Open ladder fully, lock spreader bars into place * Do not exceed ladder capacity including weight of tools or materials. * Keep belt buckle between the rails – do not overextend / overreach * Maintain 3 points of contact while climbing * Do NOT stand on the top step or top cap. * No work requiring lifting of heavy materials or substantial exertion shall be done from ladders * Keep area at ladder base free and clear of material, debris, obstructions, etc.   Work facing the ladder – do not stand backwards or outside the rails – body position must remain within the plane of the ladder rails at all times for stability |
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| **Personal Protective Equipment** |  |  |
| Eye Protection | * Flying Objects / Chemical Splashes | * Safety glasses meeting ANSI Z87.1 are required at all times in designated work areas. * Additional eye protection may be required when stated in an SDS or when there is a potential for chemical splashes, flying objects, sparks, etc. * Face shields for high impact activities shall be ANSI Z87+ |
| Hearing Protection | * Excessive Noise | * Hearing protection shall be worn when noise levels exceed 85 dBA or when normal conversation is difficult at 3’ distance between workers. * Hearing protection will be increased when noise levels approach or exceed the Noise Reduction Rating (NRR) of the hearing protection in use. * Limit noise and those exposed in the area as much as possible by substituting for quieter equipment or isolating the noise source rather than solely relying on hearing protection. |
| Head Protection | * Falling Objects & Impacts | * Hard hats meeting ANSI Z89.1 are always to be worn with the brim facing forward in work areas unless designed to be worn in either direction. |
| Foot Protection | * Crush / Foot Impalement | * Safety footwear shall be worn as required on site by personnel and visitors on the project. The type of acceptable footwear shall be determined based on the general site and specific activities on site. |
| **Hoisting and Rigging / Crane Operations** |  |  |
| General Hoisting and Rigging | * Struck by, caught between, equipment   failure. | * In addition to all applicable OSHA requirements, all Hoisting & Rigging * DOESTD-1090-2011 requirements must be followed. * Use qualified, trained riggers. * Use Certified/Trained equipment operators. * Training must be verified in the field and documented. * Equipment shall have a documented inspection completed by operator * prior to use. * The documented inspection must be kept in the equipment. * Equipment must be used according to the manufacturer's instructions. * Completed and approved crane lift plan as required. * Safety Representative or qualified site designee will be responsible for verifying critical lifts. * Rigging inspection prior to use is required. * All lifts require tag lines on loads. * Set up barricades and signage to warn others of hazards. * Signal personnel must be trained and clearly identifiable (high visibility * contrasting color on hardhats, gloves, or vest) * Damaged rigging and or equipment shall be immediately tagged out “Do * Not Use”. * Cut resistant level 4 gloves are required when handling of materials with * sharp edges, handling wooden materials, or performing cutting/puncturing   tasks.   * No worker shall be under any load. * All equipment and materials must secure when being moved. * Unstable material must be strapped down. * Spotters are to be used at all times the equipment is moving. |
| Rigging Equipment | * Defective rigging equipment | * Hoisting and rigging equipment shall be inspected for excessive wear and defects prior to, during, and after each use * Defective rigging will be immediately removed from service and tagged “defective” * All hoisting and rigging equipment shall have a permanently attached tag showing size, grade, rated capacity, and identification number * Rigging shall be free of knots and kinks * Hoisting and rigging equipment shall not be loaded in excess of its safe working load * Job or shop hooks and links, or makeshift devices, formed bolts, rods, etc., or other such attachments shall not be used. * Only equipment designed for hoisting and rigging shall be used in hoisting and rigging operations * Wire ropes or synthetic slings shall not be secured by knots * Softeners shall be used with synthetic slings * Custom lifting devices shall be marked with safe working load limit * Custom lifting devices shall have a documented proof test and PE stamp prior to initial use. * Hooks used for hoisting and rigging operations shall be provided with safety latches * Tag lines shall be used to control suspended loads |
| **Welding / Cutting / Grinding / Hot Work** |  |  |
|  | * Fire * Burns | * Hot Work Permit is required for spark/flame producing work as well as a fire   watch during activities and one hour past activities.   * No hot work, welding, or smoking shall be allowed within 50ft of   flammable and 30-feet from combustible materials storage areas.   * Ensure that suitable fire extinguishing equipment is available and that fire watch personnel have been trained in its use. * Storage area yards shall be kept free from accumulation of unnecessary   combustible materials.   * Acetylene tanks shall be stored 20 feet from oxygen tanks or separated by   a fire wall with a one-hour fire rating when not in use. |
|  | * Welding / burning fume exposures | * Contractors shall evaluate welding fumes and identify control measures. * Welding fumes need to be assessed by type of metal along with a number of variables when determining control measures such as: weld type, welder setting, base and core/electrode metal, flux coating, work rate, body positioning, location, which all affect the fume generation and ability of fumes to enter the worker’s breathing zone. * Special emphasis on welding fume constituents, such as manganese, chromium, nickel, cadmium, due to either extremely low exposures limits and recent declaration as carcinogenic and must be a point of emphasis when evaluating welding tasks. * Various metals have independent standards that govern their use, for instance hexavalent chromium/nickel associated with stainless steel, manganese/iron oxide with mild steel, and zinc oxide fumes with galvanized steel. * Other considerations associated with welding include hot work permitting, UV, noise, gases, (ozone, NOx, CO) and material coatings. Coatings shall be removed 4 inches on all sides of welding location. Welding related exposures are tied to many variables, Battelle requires contractors to provided details of each welding task and when requested provide objective exposure data. |
| **Layout Electrical Panels / Conduit** |  |  |
| Locate / Identify Panel Locations | * Struck-by / slips / trips * Unseen hazard(s) | * Watch for equipment, technicians – pause work until the hazard has passed * Read signage on doors/areas where layout occurs to understand hazard(s) of the space * Watch path of travel – avoid obstructions * Identify future locations with tape/other markings |
| **Install Conduit** |  |  |
| Run Conduit using Ladder or Scissor Lift or Aerial Lift   * Conduit to panel(s) * Conduit to conduit * Conduit to J-box * Cutting conduit to length * Bending conduit * Attach to support(s) | * Muscle strain / sprain * Cut/laceration/contusion * Slips / Trips / Falls * Struck-by * Falling / Dropped Object | * Wear gloves, observe hand placement and body position – keep out of the line of fire * Power Tool Use – See Hand Tool / Power Tool Use – Section * Inspect bender / cutter before use- if damaged, Tag and remove from service * Keep tools, materials neatly stored / staged at the work area * Clean up scrap / debris when work is complete * Ladder use – See Ladder Use section * Aerial Lift / Scissor Lift Use – See Aerial Lift / Scissor Lift Section |
| Pulling Wire | * Muscle strain / sprain * Cut/laceration/contusion * Struck-by | * Wear gloves, observe hand placement and body position – keep out of the line of fire * Secure / stabilize ladder before climbing (hold from below) – See Ladder Section |
| Install Grounding   * Ground bar * Ground wire – unrolling / cutting * Clamping - wire to wire / wire to lug | * Muscle strain / sprain * Cut/laceration/contusion * Struck-by | * Wear gloves, observe hand placement and body position – keep out of the line of fire. * See hand tool use / power tool use sections (above). * Keep hands away from hand-held power shear when cutting wire * Keep hands clear of jaws when using power crimping tool (wire to wire / wire to rod). |
| **Confined Spaces** |  |  |
| Permit / Non-Permit Required Confined Space | * Hazardous Atmosphere / Lack of oxygen | * Follow approved contractor Confined Space Program * All Employees will be trained on the site-specific Confined Space hazards and safety equipment available / to be used. * PRIOR to entry –Verify classification of space as permit / non-permit. * Verify oxygen monitor is not in alarm. * Continuous air testing/monitoring before & during entry. * Verify 4-gas monitor functions properly / current calibration / Bump test as required. * Document initial and periodic instrument readings. * Conduct Pre-Task briefing. * Once entry is completed, document on entry form * Do NOT enter if Monitor Alarms – inform site supervision immediately * Enter with 4-gas monitor. If 4-gas monitor alarms – Exit immediately |
| **Control of Hazardous Energy (LOTO / LTV)** |  |  |
| Perform Lockout / Tagout   * Electrical Energy Source(s) * Power cords * Panels * Breakers | * Shock / Electrocution | * Follow approved contractor Lockout Tagout Program * Identify hazardous energy source(s) – electrical, mechanical, hydraulic, fluids, gases, etc. * Hazardous energy source(s) present must be de-energized and locked out before beginning work involving the hazardous energy source(s) * Conduct coordination briefing with ORNL to facilitate integration of LO/TO activities involving ORNL controlled systems * For ORNL controlled systems/equipment, provide 5-day advance notice of LO/TO request * Each Authorized employee will be assigned their own individually keyed lock * Each Sub-tier contractor employee will provide their own locks and tags * Each authorized employee will be lockout / tagout trained * Conduct task-specific Pre-job briefing for all authorized and/or affected employees. * Qualified person verifies ZERO energy using multi-meter. If Energy present, inform supervisor Immediately. If ZERO energy confirmed – proceed with work. |
| **Electrical** |  |  |
| Identifying circuits (power / lighting) | * Conflicting Information * Inaccurate drawings * Obstructions | * Verify routing / circuit feed, etc. Obtain clarification as necessary. Do not trust drawings alone. * Coordinate shutdown of breaker / air gap with ORNL |
| “No Live Electrical Work” | * Shock * Electrocution * Burns | * Prepare ORNL Electrical Energized Work Permit for specific scope/circuits to be Verified as De-energized. Submit to ORNL TPO for review/approval * ORNL Utilities will shut down breaker / remove wire(s) from breaker(s). * ORNL Utilities will provide “air gap” as necessary * LTV (LO/TO) by ORNL Utilities – Contractor(s) applies lock to ORNL Energy Isolation device * Verify ZERO Energy using multi-meter. If Energy present, inform supervisor immediately. If ZERO energy confirmed – proceed with work |
| General Electrical Work | * Shock * Electrocution * Burns | * All exposed electrical lines, panel boxes and outlets shall be de-energized prior to working within the limited approach boundary. * Only qualified electricians shall perform work on electrical items. * Inspect all extension cords for broken insulation, missing ground plugs or any visible defects prior to use. Remove from service if discovered. * An EEWP is required for all energized work including safe-to-work checks in support of lockout and tagout. This permit is issued by ORNL. * Superintendent or foreman shall conduct and document a pre-job safety briefing on the work to be performed. * The backup person shall be first aid CPR trained and familiar with electrical emergency response actions. * Employees shall be required to wear PPE when disconnecting / breaking neutral conductors (i.e. receptacles, lights, panel board, & switchgear neutrals). |
| Wire / Conduit / Device install and removal Conduit riser / support(s) on Ladders | * Muscle strain / sprain * Cut/laceration/contusion * Falling – step ladder * Falling – from top | * Wear gloves, observe hand placement and body position – keep out of the line of fire * Verify ZERO Energy using multi-meter. If energy present, inform supervisor Immediately. If ZERO energy confirmed – proceed with work * Power tool use – See Hand Tool / Power Tool Use Section * Proper ladder selection / step ladder use – Refer to Ladder Section * Remove material from work area and clean as you go |
| Wire / Conduit / Device removal Interior / Exterior using Aerial Lift or Scissor Lift | * Muscle strain / sprain * Cut/laceration/contusion * Falling – step ladder * Falling / dropped object | * Wear gloves, observe hand placement and body position – keep out of the line of fire * Verify ZERO energy using multi-meter. If Energy present, inform supervisor immediately. If ZERO energy confirmed – proceed with work * Power Tool Use – See Hand Tool / Power Tool Use Section * Proper ladder selection / step ladder use – Refer to Ladder Section * Aerial Lift / Scissor Lift Use – See Aerial Lift / Scissor Lift Section |
| Core Drill floor penetrations | * Falling / Dropped object * Utility strike (conduit, plumbing, etc.) | * Review ORNL Penetration Permit * Conduct walk-down of room/space below to identify potential conflicts * Barricade area below core drill location(s) / set-up catch-bucket for slurry, debris * Spotter provided in room below core drill(s) to monitor progress / keep personnel away * Drill pilot hole first / proceed with actual core drilling when verified “All clear” * Cover new hole to prevent falling objects |
| **Panels / Disconnect Switch Install** |  |  |
| Mount Panels | * Muscle strain / sprain * Cut/laceration/contusion * Slips / Trips / Falls * Eye Injury | * Obtain assistance for material over 50-lbs. or awkward shape/sized material * Wear gloves, observe hand placement and body position – keep out of the line of fire * Inspect hand tools (hammer, pliers, wrench, etc.) before use – Red Tag & Remove from service if damaged, inoperable or in unsafe condition. * If using corded electric tools, GFCI will be used at the downside of the electric cord |
| Pulling Wire / Terminate Wire in Panel(s) | * Muscle strain / sprain   Cut/laceration/contusion | * Wear gloves, observe hand placement and body position – keep out of the line of fire when stripping (skinning) wire. Use approved wire stripper * Inspect hand tools prior to use – Red tag & remove from service if damaged |
| **Scaffolds** |  |  |
| Erect Scaffold | * Improper erection of scaffold | * Scaffold erection to be installed by trained scaffolds erector(s) and working under competent supervision. * Safe means of access/egress to be provided and maintained for the scaffolders carrying out the erection work. * Suitable and sufficient materials will be available in order to be erected properly. * Scaffold users will be trained, wear gloves, safety footwear, safety helmets and safety harness during scaffold erection activities. * Scaffold components will be lifted using safe techniques. (Components will not be thrown up to the scaffolder nor to the ground). * Unauthorized personnel will be excluded from the area where scaffold erection is being carried out. |
| Inspect Scaffold, Verify inspection | * Unqualified inspector * Damaged components, missing components, incomplete components * Missing Inspection * Unqualified user | * Scaffold Inspection performed by designated Competent Person for scaffolding. * Scaffold inspected at the Start of each shift. * Scaffold Tag system in use: RED Tag (Do NOT Use) / GREEN Tag (OKAY to use) / YELLOW Tag (fall protection required at working level). * Inspection Date MUST match actual date, otherwise DO NOT USE until inspected. * Scaffold Tag located at scaffold access point (Ladder). |
| Accessing Scaffold | * Falls, falling | * All users undergo “Scaffold User Training” before being allowed access to scaffold. * Use designated LADDER access point – Do NOT climb cross-braces to access scaffold. * Do NOT carry tools, materials while accessing scaffold – use tag lines to raise/lower tools & materials. * Lock wheels before accessing mobile scaffold. |
| Working on scaffold | * Falls, falling * Dropped objects * Severe Weather – lightning, tornado | * Keep platform clear of debris and material. * Remove excess material / tools / debris when finished working on Scaffold. * Keep wheels locked on mobile scaffold. * Do NOT modify scaffolding – contact Scaffold erection supervisor for assistance. * Exit exterior scaffold during severe weather alert (lightning, tornado, etc.). * Utilize tool tethers, etc. to secure tools, material on scaffold. * Do NOT work below scaffolding. * Verify netting is in place (if applicable) from guardrail down to toe board. |
| Working around / near scaffolding | * Struck by / falling objects | * Barricade area BELOW scaffold when working above * Barricade area around scaffold when Erecting OR Dismantling scaffold * Install toe-boards AND screening to prevent tools, material from falling below |
| Dismantle scaffold | * Scaffolding collapse * Falls from elevation * Falling objects | * Scaffolds will be tagged as ‘safe to use’ by a competent person on completion. * Dismantling of scaffolding to be carried out by trained and competent scaffolders under supervision. * An assessment (by the supervisor in charge) of the best method of dismantling the scaffold will take place that reduces overall risks, risk of falling materials and maintenance of the stability of the structure. * No ties or bracing will be removed in advance of general dismantling. * Working platforms will be dusted and cleared of all materials and debris before dismantling commences. * All possible access to the dismantled sections of scaffolding should be barred and a warning sign displayed. * Scaffold materials will be lowered carefully. * Surplus boards and fittings will be removed from the platforms as the work progresses and at the end of each day. * Tubes and fittings will be stacked at ground level unless the first lift has been designed to support the extra loading. |

**AHA / JHA Signature Page Template**

**A signature means that the worker has read, understands, and will comply with this ORNL JHA/AHA, including taking actions to eliminate or minimize general hazards on the worksite. If work deviates from this AHA/JHA it should be paused or stopped until the JHA/AHA has been revised and all affected workers are briefed to the new hazards.**

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