

Fall From Height

Engineering Controls

- Use guardrails and install floor hole covers where possible to reduce the exposure to falling.

Administrative Controls

- Provide fall protection training.
- Utilize planning process to identify fall hazards and systems.
- Install signage on hole covers.
- Install signage in areas that require fall protection.

Implementation

- All guardrails shall have a top rail, mid-rail, and toe-boards.
- All holes 2 inches or greater shall be securely covered and labeled.
- When using a personal fall arrest system, it shall consist of a full body harness and self retracting lanyard(s).
- Shock absorbing lanyards are not permitted.
- Adequacy of anchorage points shall be determined by the competent person.
- Each worker is responsible for checking their own harness each time they put it on.
- Verify that workers are wearing the harness properly and are anchored correctly.
- Harnesses should be snug (2 finger tuck) while allowing full movement.
- The best place for an anchorage point is directly above the work area.
- Restraint systems shall be designed to prevent a fall.
- Positioning device systems shall be used in conjunction with a personal fall arrest system.



Slips, Trips & Falls

Engineering Controls

- Designate controlled pathways.
- Use cord protection ramps.
- Elevate cords a minimum of 7 feet above walkways where feasible.
- Provide adequate lighting for work areas and pathways.

Administrative Controls

- Conduct work area inspections.
- Ensure adequate resources are available to provide housekeeping.
- Identify designated walkways.

Implementation

- Housekeeping shall be performed daily as work progresses.
- Perform a 360 degree observation of your surroundings.
- Remove materials from stairs and walkways.
- Cover or elevate cords.
- Shovel away all snow, ice, mud, etc.
- Store all tools and materials in a designated area.
- Repair uneven, defective flooring or worn stairs. Keep ramps slip resistant with special anti-slip paint or other slip resistant material.
- Avoid carrying materials that will block visibility.
- Pay attention to these areas: change in elevation, access around corners, at the base or top of ladders and scaffolds, near equipment or trucks, etc.
- Avoid distractions such as talking, texting, and emailing while walking.
- Avoid walking backwards as much as possible. Do not wear dark safety glasses while working indoors.
- Rebar mats shall have a designated walk path for safe access across.
- Operations that require wet methods shall contain and clean the slurry, run-off, water, mud, etc.



Strains & Pulled Muscles

Engineering Controls

- Use material handling equipment as much as possible.

Administrative Controls

- Conduct a Stretch & Flex program.
- Train workers on proper lifting technique.
- Stage material to avoid double handling.
- Observe employees' fitness for duty.

Implementation

- Participate in stretch and flex.
- Use mechanical handling tools (fork lift, pallet truck etc.)
- Know your capabilities.
- Know the weight of the load you are lifting.
- Make sure there's a clear walkway with good lighting to the work area.
- Do not carry a load that obscures your vision.
- Stand close to the load, feet hip-width apart, one foot slightly forward pointing in the direction you are going.
- Bend your knees and keep your back straight, get a secure grip on the load, and breathe in before lifting to help support your spine.
- Keep your back straight and lift using your legs.
- Keep the load close to your body, and lift slowly and smoothly.
- Avoid jerky movements, and avoid twisting your body when lifting or carrying a load.
- Ensure there is clear communication when there are two or more people handling a load.



Power / Hand Tool Injuries

Engineering Controls

- All guards must be in place.
Secure materials.
Use a designated cutting station.

Administrative Controls

- Refer to the tool manufacturer's user's manual for complete instructions and safety precautions.
- Use a tool inspection schedule, and tag out tools that are not functioning properly.
- Provide hand and power tool training.
- Obtain the required Hot Work Permit for spark producing operations.

Implementation

- Select the appropriate tool for the task.
- Ensure that the worker using the tools is properly trained in its safe use.
- Ensure that users of powder actuated tool are certified and have their card on them at all times.
- Inspect all tools daily. Tag and remove any damaged tools immediately.
- Check wooden handle tools for splinters or cracks. Ensure that all handles supplied by the manufacturer are installed.
- Keep knives and other tools sharp.
- Ensure that tools are free from mushroomed heads.
- Follow the manufacturer's recommendation for lubricating and maintaining tools.
- Control loose clothing, hair, and jewelry.
- Use task specific gloves while operating tools.
- Ensure that guards are in place before operating a tool.
- Maintain a firm footing and safe body position when operating a tool.
- Secure work with clamps so you can use both hands to operate the tool.
- Chaps are required when using a chain saw or demo saw.
- Face shields are required when grinding, cutting, chipping, etc.



Struck By / Caught Between

Triggered

Severity	Initial Likelihood	Initial Risk
Catastrophic	Likely	High

Engineering Controls

- Barricade work areas such as equipment swing radius, overhead work, traffic, etc.
- Ensure adequate illumination.
- Use backup alarms and horns.
- Ensure overhead protection.

Administrative Controls

- Identify pinch points, man / machine interface, overhead work, and traffic control patterns.
- Perform and document daily equipment inspections.
- Follow proper loading and unloading procedure.

Implementation

- Inspect the work area for possible struck by / caught between hazards such as high traffic areas, overhead work, etc.
- Maintain and communicate establish controlled access zones.
- Ensure that workers on the ground establish eye contact with operators prior to entering their operation area.
- Ensure that only qualified operators operate machinery.
- If safety devices such as horns or reverse alarms are not functional, red-tag the machine.
- Use flaggers when traffic plans dictate.
- When operators are unable to see clearly while backing, use a spotter.
- Do not stand or walk behind or alongside moving equipment.
- Never depend upon hearing a horn or other warning signal.
- Identify overhead hazards and add proper signage.
- Anticipate stored energy while pulling, pushing, loading, unloading, jacking, blocking, etc.
- Secure pneumatic tools with whip checks.
- Secure Chicago fittings with a cotter pin or clip.



Flying Objects

Engineering Controls

- Machine and tool guarding
- Controlled access zones
- Barricades
- Water and/or sweeping compound for dust control

Administrative Controls

- Equipment and tool inspections
- Controlled access zone signage

Implementation

- Ensure that all guards are in place.
- Review with all employees the type of protection required with a tool and task.
- Set up a designated cutting area before the task begins.
- Perform a visual 360 look around to ensure that employees are not in the line of fire and debris will not go beyond the prepared work zone.
- Ensure all employees in the work area are protected.
- Secure the materials from moving while cutting them.
- Wear goggles to prevent dust and airborne materials from entering the eye.
- Maintain housekeeping at all times.
- Use a vacuum instead of blowers to remove debris.
- Evaluate weather conditions prior to activities.
- When using a blower, blow away from other workers.
- Do not use compressed air to blow off clothing.



Rigging Failure (Slings / Shackles / Taglines)

Engineering Controls

- Spreader bar
- Load tests
- Rated capacities of components
- Softeners

Administrative Controls

- Lift Plan
 - Load charts
 - Qualified riggers
- Capacity tags
Inspections

Implementation

- Identify the rigging in the Lift Plan.
- Only qualified riggers shall rig the load.
- Identify qualified riggers visually by a means such as unique vests, hard-hats,
- Inspect all rigging prior to lifting.
- Ensure rigging is free from nicks, cuts, burns, tears, wear or other damage.
- Check that safety latches on hooks are in working condition.
- Check for wear and pin distortion on shackles.
- Check for frayed or severed strands in wire rope slings.
- Damaged rigging is to be cut and disposed of immediately.
- Use taglines to control the load at all times.
- Use softeners to protect rigging as needed.
- Ensure that the work area is secure, to prevent people from entering the swing radius or walking under the load.
- Review rated capacities on slings, shackles, etc. and know the weight of the load prior to lifts.
- Do not alter equipment such as tying knots to shorten slings.
- The rigging crew must communicate "all clear" to the signal-person.
- Store rigging in a manner that avoids damage.



Noise Exposure

Engineering Controls

- Mufflers
- Sound barriers

Administrative Controls

- Hearing conservation program
 - Job rotation
 - Monitoring Training
- Signage for high noise areas

Implementation

- Conduct baseline monitoring of noise creating activities to determine appropriate protective devices.
- Ensure that personal noise dosimetry is conducted by a qualified person to determine exposure.
- Ensure that audiometric (hearing) testing is performed when monitoring indicates that there has been an exposure at or above 80% of the PEL.
- Delineate areas of high noise with signs and barricades.
- Provide a choice of at least two different hearing protection devices.
- Rotate employees out of high noise areas.
- Inspect equipment for functioning mufflers.
- Provide sound barriers for adjacent activities and communities.
- Be aware of the effects of noise leaving the project site.



Silica Dust Exposure

Engineering Controls

- Wet cutting and drilling methods
 - Use water or soil amendments for off highway haul roads.
 - Use water for dust generating activities.
- HEPA vacuuming
Enclosed cabs

Administrative Controls

- Respiratory protection program
- Respiratory training
- Job rotation

Implementation

- Conduct baseline monitoring to determine appropriate respiratory protection.
- All workers must be clean shaven to properly wear a respirator.
- Workers must be properly trained to use their respirators.
- Workers must regularly clean and inspect their respirators.
- Provide a designated storage area for respirators.
- Wear washable or disposable work clothes.
- Workers must wash hands before eating drinking, smoking, etc.
- Do not eat, drink, use tobacco or apply makeup near areas containing silica dust.
- Use wet methods and/or HEPA vacuums to control dust.
- Vacuum away cutting slurry.
- Use sweeping compound when sweeping.



Pickup Trucks / Flat Trucks

Engineering Controls

- Manufacturer's design
- Backup camera
- Audible warning devices

Administrative Controls

- Traffic control plans
- Inspections
- Current driver's license applicable to the vehicle

Implementation

- The following must be checked daily and documented:
 - All lights and signals
 - Windshields, windows, wipers and mirrors
 - Leaks
 - Tires and wheels
 - Housekeeping in cabs and beds
 - Condition of truck beds and flat decks
- All loads placed on any type of vehicle must be stacked, racked, blocked, interlocked, and/or secured to prevent sliding, falling, spilling and/or collapse.
- Do not climb on unstable, slippery or irregular loads.
- If the height of a potential fall from a truck is greater than 6 feet, then fall protection is required.
- Do not allow people to stand adjacent to vehicles when dumping a load or when it's in motion.
- While driving, adhere to all traffic regulations and observe the site's speed limits.
- Do not use cell phones or radios while your vehicle is in motion.
- Check overhead clearances, and make personnel in you area aware of your presence.
- The driver and any passengers must wear buckled seatbelts whenever the vehicle is moving.



Electrocution / Shock

Engineering Controls

- Barricades and enclosures
 - GFCI
 - Overcurrent devices
 - Grounding systems / rods
- Insulated overhead power lines
Utility relocates

Administrative Controls

- Assured equipment grounding program
 - NFPA 70E Arc flash protection
 - Utility locates, as-builts, BIM models, etc.
 - Signs for overhead or below ground electric lines
- Lockout / Tagout

Implementation

- The Assured Grounding program requires quarterly inspection of all tools, extension cords and GFCIs.
- During inspection, check for continuity, exposed wires, cuts, missing ground plugs, and significant wear.
- Cut any extension cords / GFCIs that do not pass the Assured Grounding Testing and discard them immediately.
- Red-tag any tools that do not pass the Assured Grounding Testing and remove them from service.
- Call for utility locates prior to digging.
- Identify overhead power lines with signs and flagging to ensure a safe working distance.
- Ensure that exposed live parts are protected.
- Secure electrical rooms and post proper signage.
- Electrical tape is not allowed for repairs.
- Energized electrical work requires an approved Energized Electrical Work Plan.
- Ensure that conductive material is not used to hang cord sets or welding leads.



Confined Space

Engineering Controls

- Ventilation

Administrative Controls

- Signage
- Permits
- Training: entrant, attendant, supervisor, and rescuer

Implementation

- A confined space checklist shall be completed.
If the confined space requires a permit, the following applies:
 - Ensure that the area is properly marked as a confined space.
 - Ensure that barriers to prevent unauthorized entry are in place.
 - Ensure that a rescue team is identified and available prior to entry.
- The designated entry supervisor will make sure the permit is complete.
- The designated entrants will supervise air testing for oxygen, combustibles and toxic contaminants, identify other possible hazards (e.g. changing atmosphere,) identify the tools / materials needed to complete the task, and understand self rescue procedures.
- The designated attendants will watch the area and keep others away, monitor the entrants and communicate with them as they work.
- The designated attendants shall know the signs of problems and have the authority to order entrants out of the space. In addition, they will have the means to summon a rescue team, use lockout / tagout procedures, use gas detective devices, and use a recovery system designed to pull out entrants.



Aerial Work Platforms

Engineering Controls

- Anti-crush devices
- Manufacturer installed safety devices
- Pot hole protection for scissor lifts
- Out-riggers

Secured to floating surfaces

Administrative Controls

- Certified operator training.
- Ground control rescue training
- Daily inspections
- Exclusion zones

Implementation

- All aerial work platforms shall be equipped with anti-crush mechanisms.
- Daily inspections shall be completed and documented.
- Verify operators have been trained and are operating the equipment per the manufacturer's instructions.
- Operators shall wear a full body harness and tie off to the manufacturers attachment point with a self retracting lifeline.
- Aerial work platforms must be lowered prior to traveling.
- Keep body parts inside the basket when booming, swinging or traveling.
- When operating aerial work platforms, stand firmly on the floor of the basket.
- Maintain a minimum clearance of at least 10 feet away from the nearest overhead power lines. See OSHA table K-1 for clearance requirements over 50,000 KV.
- Do not exceed the load limits of the equipment. Allow for the combined weight of the worker, tools, and materials.



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Hot work (Burning / Welding / etc.)

Engineering Controls

- Welding shield
- Fire blanket
- Water
- Ventilation

Administrative Controls

- Hot work permit
- Air monitoring results
- Respiratory protection program
- Fire watch

Implementation

- Oxygen and acetylene bottles must be kept in an upright position and secured.
- Oxygen and acetylene bottles will be stored 20' or greater apart or be separated by a barrier with at least a 1/2 hour noncombustible burn rating.
- Do not attempt to lift bottles alone by hand. Roll them or use a cart or dolly.
- Bottles can be lifted only in a secured cart or rack with an engineered picking eye.
- Bottles must have on protective caps when not being used and while being transported.
- Ensure that valves are closed at the torch before turning on regulator valves.
- All hoses shall have flash arrestors at the torch end.
- Check gauges, valves, regulators, torch tips, and hoses for signs of wear or damage. Listen for leaks.
- Inspect welding leads and cords for damage and remove from service if damaged.
- Protect the rods and leads and ensure that they are kept dry.
- Inspect the area for flammable / combustible material and remove prior to commencing hot work.
- Ensure work area is well ventilated and wear proper respiratory equipment.
- Welding hoods must be used with a hard hat. Use appropriate lens for cutting and welding.
- Light the torch away from your body.
- Use a fire watch with a fire extinguisher for a 1/2 hour after hot work ceases.



Lead Exposure

Engineering Controls

- Needle gun with HEPA vacuum to remove paint

Administrative Controls

- Lead awareness training
- Sampling results / Safety data sheets, Identification of lead sources
- Lead abatement plan
- Medical monitoring

Implementation

- Spot abatement shall be completed prior to welding or cutting on lead painted areas.
- For lead lined drywall, follow manufacturer's recommendations. (No abrasive cutting is allowed.)
- Lead work areas shall be identified and controlled to only allow authorized personnel.
- Decontamination procedures shall be followed prior to eating, drinking, smoking, or leaving the work site.
- Personal monitoring shall be performed to identify potential exposure.
- Minimize dust by wet methods, HEPA vacuums, and ventilation.



Trenching & Excavation Cave-In / Utilities

Engineering Controls

- Trench boxes, speedy shores, timber lagging, benching, sloping, and supported excavation
- Dewatering
- Underpinning

Administrative Controls

- Utility locates and as-builts
- Excavation permit
- Tabulated data for engineering controls
- Training and inspections

Implementation

- Competent person must be on-site at all times and must complete a documented daily excavation checklist. An inspection must also be completed following a change in conditions such as a rain event, seismic activity, etc.
- An excavation permit shall be issued that identifies the soil classification and the protective system to be used.
- Visible barriers must be placed around the perimeter to prevent unauthorized access
- All excavations must have safe access regardless of depth such as a ladder or ramp.
- In trenches, access to work area must include a travel distance of no greater than 25 feet for access/egress.
- Equipment, materials, tools and excavated soil must be kept at least 2 feet from the edge of pit, to reduce the risk of their falling into the excavation.
- Openings such as pipe piles and manholes are to be protected.
- Underground utilities must be marked. When utilities might be present, hand excavate to expose utilities prior to excavation with equipment.
- Fall protection is required when a fall hazard is present.
- Underground installations shall be protected, supported or removed as necessary.
- Excavations shall be delineated or barricaded to prevent exposure to traffic.



Spill / Leak

Engineering Controls

- Secondary containment
- Barricades
- Preventative / predictive maintenance

Administrative Controls

- Daily equipment inspections
- Spill Prevention Control and Countermeasure plan (SPCC) SWPPP
- Safety data sheets

Implementation

- Equipment shall be inspected daily and maintenance schedules shall be followed.
- Perform inspections as required per legal and other requirements.
- Install barricades around fuel, oil and chemical storage areas.
- Ensure that secondary containment is utilized for static equipment or storage facilities.
- In the event of a spill / leak, notify the Skanska Superintendent immediately.
- If the spill / leak is hazardous, follow the emergency action plan.
- Properly clean up and dispose of any spilled substance immediately to protect personnel and the environment from potential fire and health hazards.
- Ensure that no spilled materials are washed into the streets, gutters, storm drains, or creeks.
- If possible, use dry cleaning methods to clean up spills to minimize the use of water.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Clean up chemical materials with absorbents, gels, and foams. Use absorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of it properly.
- The competent person must inspect the area after cleanup to ensure the area is safe for workers and pedestrians.



Inadequate Illumination

Engineering Controls

- Lights

Administrative Controls

- Light meter
- Visual observations

Implementation

- In work areas where the level of lighting is questionable, measure the illumination.
- Record the measurements and determine the proper lighting requirements.
- Contact responsible party to provide additional lighting.
- Beware of low lighting in the early morning and late afternoon, especially in the winter months.
- Clear safety glasses should be used while working indoors or outside at night.



Heat Illness

Engineering Controls

- Provide a shaded area

Administrative Controls

- Heat illness training
 - Acclimatization
 - Hydration
 - Work schedules
- Job rotation

Implementation

- Employees shall be trained to identify the signs of a heat related illness, which include:
 - Heat cramps: brief, periodic cramps in the muscles of the arms, legs or abdomen
 - Heat exhaustion: tiredness, weakness, thirst and dizziness, occasionally with headache, nausea, diarrhea and fainting, skin is moist
 - Heat stroke: confusion, delirium, dry skin, loss of consciousness, convulsions and coma
- Prevent heat stress by:
 - Hydration should begin prior to getting to work. Drink cool water, fruit juice, or an electrolyte- replacement frequently and moderately, about 8 ounces every 15-30 minutes, even if not thirsty.
 - Avoid alcohol, coffee and tea consumption, which contribute to dehydration
 - Rest frequently, eat lightly, and get adequate sleep
 - Do more strenuous jobs during the cooler morning hours
 - Use ventilation or fans in enclosed areas
 - Wear light colored clothing
- It takes about 1 - 2 weeks for the body to adjust to the heat. Remove victims of heat stress from the heat source. In the event of heat stroke, dial 911 immediately.



Compressor / Air Pneumatic Tools

Engineering Controls

- Whip checks

Administrative Controls

- Daily inspections
- Manufacturers recommendations
- Training

Implementation

- Follow the manufacturer's recommendations for lubrication and maintenance.
- Keep air hoses free of grease and oil to reduce deterioration.
- Inspect tools, equipment and hoses daily.
- Inspect to see if shutoff valves are in proper working order.
- Remove broken operating mechanisms immediately.
- Ensure guards are in place before operating.
- Use whip-checks and cotter pins or clips on Chicago fittings.
- Maintain a firm footing when using pneumatic tools.
- Hoses shall be placed to avoid tripping hazards or puncturing while in use.
- Before pneumatic tools are disconnected the air must be turned off at the control valve and the pressure bled.
- Do not use compressed air to clean off yourself or for housekeeping.



Scaffolds / Temporary Works

Engineering Controls

- Manufacturer's engineered system

Administrative Controls

- Stamped engineer designs
- Temporary works general awareness training
- Training for erectors and users
- Daily scaffold / temporary works inspection, Scaffold tags

Implementation

- A readiness review shall be completed prior to installing scaffolds / temporary works systems.
- Structures shall be erected per the manufacturer's specification and/or engineered design.
- The competent person shall supervise erection, conduct inspections, and approve alterations.
- Provide safe access to all working levels.
- Scaffolds / temporary works shall be tagged at all access and egress points.
- Scaffolds / temporary works shall be fully planked / decked.
- Any damaged components shall not be used.
- Ensure that all components are compatible.
- Guardrails shall be in place on all open sides.
- Mobile scaffolds shall not be moved while occupied.



Stairways / Ladders

Engineering Controls

- Manufacturer's engineered design

Administrative Controls

- Implementation of Ladders Last program
- Inspections
- Training

Implementation

- A stairway with 4 or more risers or rising more than 30 inches shall be equipped with at least one handrail and one stair rail along each unprotected side. Metal stair pans shall be in-filled before being put into service.
- Handrails shall be free of burrs, splinters, splinters, or other defects.
- Keep stairways and ladder access clear of materials, tools, and debris.
- Working off of ladders should be considered the last option. Alternatives include portable scaffolds, scissor lifts, lift pods, stair towers, etc.
- Podium ladders shall have the top rail at least 30 inches above the platform.
- Ladders shall be inspected before each use, capacity tags must be legible, and monthly inspection tags current. Damaged ladders must be removed from service and destroyed.
- Metal ladders are not allowed.
- Never use a ladder on top of a scaffold or work platform unless it is designed for such use.
- Ladders will be secured at the top to prevent movement, as well as at the bottom where possible.
- Do not lean step ladders against a wall for use. Make sure it's fully open and the spreaders are locked. Do not climb, stand or sit on the top two steps.
- Ladders will be erected at a 4:1 vertical height to horizontal distance.
- Pass through brackets or corrals should be used at the top of access ladders.



Lifting equipment other than cranes

Engineering Controls

- Engineered picking attachments
- Manufacturer's specifications
- Barricades

Administrative Controls

- Daily equipment and rigging inspections
- Qualified operator training
- Load charts & Lift Plans
- Exclusion zones

Implementation

- Equipment and rigging shall be inspected daily.
- Determine weight of all loads and equipment capacities prior to lifting.
- Travel paths shall be evaluated prior to moving.
- Position equipment properly and plan where loads are to be landed.
- Use taglines on all loads.
- Plan work according to weather conditions.
- Signal person must be properly trained in the use of hand signals.
- When lifting with a forklift or material handler under the forks, an engineered lifting attachment must be used.
- Overhead utilities shall be identified utilizing signage.
- Only manufacturer's fork extensions shall be used.



Lockout / Tagout

Engineering Controls

- Enclosures, locks, barricades, grounds, etc.

Administrative Controls

- Tags
- Training
- Lockout / Tagout form
- Lock removal permit

Implementation

- Potential stored energy sources shall be identified such as electrical, chemical, mechanical, thermal, steam, hydraulic, pneumatic, and gravity.
- The LOTO coordinator shall coordinate with a qualified person to shut down the equipment or system.
- The potential stored energy source shall be isolated to prevent the release of energy.
- Turn off the power at the panel box, use manually operated circuit breakers, disconnect switches, line valves and safety blocks, etc.
- Lock out the energy source. Lockout requires use of a lock or other lockout device to hold the energy.
- Any lock should have a tag stating name, company and contact number for employee working on system.
- Attempt to restart the equipment or system to visually verify that the energy source is actually shut down and that the equipment or system will not start or function.
- Every employee working on the system will place a lock – do not work off another person's lock – use a group lock box or hasps for large groups.
- If an employee leaves without removing their lock, a lock removal permit shall be required for the lock to be removed.

