

EMBARC SA-PLN-620.00 CONTRACTOR SAFETY MANUAL

Version 1, October 2022



FORWARD TOGETHER



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DOCUMENT REVISION LOG

Each revision to the Contractor Safety Manual shall be issued with a revision log requiring an authorized signature and date of revision.

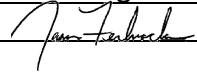
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ACRONYMS

- ANSI** — American National Standards Institute
- CFR** — Code of Federal Regulations
- COTPA** — Central Oklahoma Transportation and Parking Authority (EMBARC)
- CSO** — Chief Safety Officer
- EIC** — Employee-in-charge
- FTA** — Federal Transit Administration
- GFCI** — Ground-Fault Circuit Interrupter
- GHS** — Globally Harmonized System of Classification and Labeling of Chemicals
- IDLH** — Immediately Dangerous to Life or Health
- JHA** — Job Hazard Analysis
- MUTCD** — Manual on Uniform Traffic Control Devices
- NFPA** — National Fire Protection Association
- NIMS** — National Incident Management System
- NIOSH** — National Institute for Occupational Safety and Health of the US Department of Health and Human Services
- NTD** — National Transit Database
- OCS** — Overhead Contact System
- ODOT** — Oklahoma Department of Transportation
- OKCFD** — Oklahoma City Fire Department
- OKCPD** — Oklahoma City Police Department
- OMC** — Operations and Maintenance Contractor for the OKC Streetcar
- OSHA** — Occupational Safety and Health Administration
- PFD** — Personal Flotation Devices
- PPE** — Personal protective equipment
- PTASP** — Public Transit Agency Safety Plan
- ROW** — Right-of-Way
- SCBA** — Self-Contained Breathing Apparatus
- SDS** — Safety Data Sheet
- SMF** — Storage and Maintenance Facility



SMS — Safety Management System

SOP — Standard Operating Procedure

SSM — OMC Safety and Security Manager

SSOA — State Safety Oversight Agency

TPSS — Traction Power Substation

TSO — Transit Safety Oversight

TTC — Temporary Traffic Control Plan

USCG — United States Coast Guard



DEFINITIONS

The following terms are presented to offer an understanding of transit operations, road, rail, and waterway terminology relevant to these and other standards and documents referenced in the following sections. This is not a complete list of Federal definitions. For a complete list of definitions specific to any program in [29 CFR 1903](#), [1910](#), and [1926](#), please consult the regulation published by OSHA.

Acclimatization — the body's temporary adaptation to work in heat that occurs as a person is exposed to it over time.

Accident — an Event that involves any of the following: A loss of life, a report of a serious injury to a person, a collision of public transportation vehicles, a runaway train, an evacuation for life safety reasons, or any derailment of a rail transit vehicle, at any location, at any time, whatever the cause.

Ballast — granular material placed in the track bed to support and restrain the track, and to provide drainage.

Brace — (applies to scaffolding) a rigid connection that holds one scaffold member in a fixed position with respect to another member, or to a building or structure.

Certification Card — card issued to Track Access-trained personnel, by the OMC, that must be in the trained person's possession at all times while working on or about the streetcar system and/or within the streetcar envelope.

Clearance — The distance between specified points along the tracks and specified points on moving vehicles.

Clearance Diagram — A diagram that establishes the minimum safe distance between all points on a moving vehicle and fixed wayside structures or appurtenances.

Collision — A vehicle/vessel accident in which there is an impact of a transit vehicle/vessel with:

- Another transit vehicle
- A non-transit vehicle
- A fixed object
- A person(s) (suicide/attempted suicide included)
- An animal
- A rail vehicle
- A vessel
- A dock

Competent Person — a person who is capable of identifying existing and predictable hazards in any personal fall-protection system or any component of it, as well as in their application and uses with related equipment, and who has authorization to take prompt, corrective action to eliminate the identified hazards.



Construction — work performed by a Permittee on infrastructure or equipment, which consists of designing, building, boring, altering, replacing, repairing, improving, disposing or demolishing any infrastructure or equipment of the Permittee.

Contact Wire — the wire with which the pantograph makes contact for electric current collection. Normally made of copper or bronze — it is a single wire conductor usually with two grooves to which hangers and clamps may be fitted.

Contract Liaison — The designated EMBARK employee managing the contracted services between EMBARK and the provider as defined by the term “Contractor”.

Contractor — an individual, firm, third party, franchisee, consultant, partnership or corporation, or combination thereof, private, municipal or public, including joint ventures, retained by EMBARK or another public entity to provide construction, maintenance or other services which may impact EMBARK operations, employees, and the public. This does not include the OMC.

Crossing at Grade — an intersection of two or more tracks at the same elevation.

Current, Leakage — an electric current that flows through or across the surface of insulation when a voltage is impressed across the insulation.

Deactivation — the disconnection of electrical power to the entire OKC Streetcar System (or any segment thereof) and/or the SMF.

Derailer — a device designed to cause rolling equipment to leave the rails.

Derailment — a non-collision Event in which one or more wheels of a rail transit vehicle unintentionally leaves the rails.

Design Safety — safety achieved by integration of safety features into the system designed characteristics to prevent operation except in the manner intended to be safe.

Direction, Normal — the designed predominant direction of train traffic as specified by the rules.

Direction, Reverse — train movement against the normal direction of traffic.

Drinking Water — potable water that is suitable to drink. Drinking water packaged as a consumer product and electrolyte-replenishing beverages (i.e., sports drinks) that do not contain caffeine are acceptable.

EMBARC Employee — any COTPA employee or City of Oklahoma City employee assigned to COTPA.

Emergency — an unforeseen combination of circumstances that calls for immediate and urgent action, including accidents, incidents, collisions, and/or family emergencies.

Employer — EMBARK, the City of Oklahoma City, and all its political subdivisions, which have in their employ one or more individuals’ performing services for them in employment.

Evacuation — a reportable evacuation is a condition that occurs when persons depart from transit vehicles or facilities for life safety reasons. Evacuations to a location that may put passengers or patrons in imminent danger (such as controlled rail right-of-way) must also be reported.



Envelope — the area surrounding the streetcar track and overhead wire for which any activity that infringes upon this area requires Track Access Certification and a Track Access Permit. The envelope for the OKC Streetcar is defined as a 10-foot circumference from the center line of the track as well as a 10-foot circumference from the OCS, as depicted in Appendix D.

Environmental Factors for Heat-Related Illness — working conditions that increase susceptibility for heat-related illness such as air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload (i.e., heavy, medium, or low) and duration, and personal protective equipment worn by employees. Measurement of environmental factors is not required.

Event¹ — an athletic event, carnival, festival, parade, or other outdoor special events as defined by [Section 50-262 of the City of Oklahoma City Municipal Code-2010](#), that takes place within a two-block radius of the streetcar envelope and has the potential to disrupt normal streetcar operations.

Event² — any Accident, Incident, or Occurrence.

Exposure or Exposed — when an employee is subjected in the course of employment to a chemical that is a physical or health hazard, and includes potential (e.g., accidental or possible) exposure. “Subjected” in terms of health hazards includes any route of entry (e.g., inhalation, ingestion, skin contact or absorption).

Facility — all buildings and other stationary items located on contiguous property under common ownership or control.

Fastenings — clips, pads, insulators, joint bars, bolts, and spikes.

Fatality — a death or suicide confirmed within 30 days of a reported event. Does not include deaths in or on transit property that are a result of illness or other natural causes.

Ferry — any vessel which is being used to provide transportation only between places that are no more than 300 miles apart, and to transport only – passengers, or vehicles, or railroad cars, which are being used, or have been used, in transporting passengers or goods.

Fire — uncontrolled combustion made evident by flame that requires suppression by equipment or personnel.

Fixed Way — all wayside infrastructure.

Flagger (highway) — a person who provides temporary traffic control per OSHA and MUTCD requirements.

Flagger (streetcar) — a qualified person who is assigned to protect contractors or anyone performing work on a railroad right-of-way and is provided by the OMC and designated to provide a warning to clear the tracks for personnel working within 10 feet of the tracks. If flaggers are required for track access, an hourly cost will be assessed to the entity performing the work.

Franchisee — a business entity that has entered into a franchise agreement with the City of Oklahoma City for the operation of its facilities within the City’s public right-of-way. This includes: Any officer, director, partner, manager, superintendent, or other authorized



person exercising control over franchise agreements or on behalf of the Franchisee, and any contractor or subcontractor of the Franchisee, for purposes of compliance with the franchise agreement, operating in furtherance of and in accordance with Franchisee's scope and purpose of work for construction services.

FTA — the Federal Transit Administration, an operating administration within the United States Department of Transportation.

Grid — EMBARK facility parking lot for buses and support vehicles at 2000 South May.

Guideway — Rail fixed guideway public transportation system — any fixed guideway system that uses rail, is operated for public transportation, is within the jurisdiction of a State, and is not subject to the jurisdiction of the Federal Railroad Administration, or any such system in engineering or construction. Rail fixed guideway public transportation systems include but are not limited to rapid rail, heavy rail, light rail, monorail, trolley, inclined plane, funicular, and automated guideway.

Hazard — any real or potential condition that can cause injury, death, or damage to or loss of equipment or property or damage to the environment, a prerequisite to an accident, the potential to do harm.

Hazard Warning — any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning that convey the specific physical and health hazard(s), including target organ effects, of the chemical(s) in the container(s). (See definitions for “physical hazard” and “health hazard” to determine the hazards which must be covered.)

- **Negligible** — Acceptable without review or eliminated.
- **Marginal** — Acceptable with review or undesirable.
- **Critical** — Undesirable or unacceptable under the existing circumstances.
- **Catastrophic** — Unacceptable under the existing circumstances.

Hazard Not Otherwise Classified (HNOC) — an adverse physical or health effect identified through evaluation of scientific evidence during the classification process that does not meet the specified criteria for the physical and health hazard classes addressed in this section ([29 CFR 1910.1200](#)). This does not extend coverage to adverse physical and health effects for which there is a hazard class addressed in this section, but the effect either falls below the cut-off value/concentration limit of the hazard class or is under a GHS hazard category that has not been adopted by OSHA (e.g., acute toxicity Cat. 5).

Hazard Risk — An expression of the impact and/or possibility of an accident in terms of hazard severity and hazard probability.

Hazardous Chemical — any chemical that is a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified (HNOC).

Health Hazard — chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure), skin corrosion or irritation, serious eye damage or eye irritation, respiratory or skin sensitization, germ cell mutagenicity, carcinogenicity, reproductive toxicity, specific target organ toxicity (single or repeated



exposure), or aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in [Appendix A to 29 CFR 1910.1200 - Health Hazard Criteria](#).

Heat-Related Illness — a medical condition resulting from the body's inability to cope with a particular heat load, and includes, but is not limited to, heat cramps, heat rash, heat exhaustion, fainting, and heat stroke.

Hi-Rail — attachments that make rubber-tired vehicles (trucks, autos, special work equipment) capable of operating on rails.

Incident — an Event that involves any of the following: A personal injury that is not a serious injury, one or more injuries requiring medical transport, or damage to facilities, equipment, rolling stock, or infrastructure that disrupts the operations of a transit agency.

Injury (non-serious) — any damage or harm to persons as a result of an event that requires immediate medical attention away from the scene.

Incident — an unforeseen event or occurrence that does not result in injury or property damage.

Inspection — the checking or testing for condition, performance, and safety of equipment against established standards.

Interlocking — an arrangement or signals and signal appliances, so interconnected that their movements must succeed one another in proper sequence.

Investigation — the process of determining the causal and contributing factors of an accident, incident, or hazard, for the purpose of preventing recurrence and mitigating risk.

Ladder Jack Scaffold — A light-duty scaffold consisting of a platform resting on brackets attached to ladders.

Life Safety Reason — a situation, such as a fire, the presence of smoke or noxious fumes, a fuel leak, a vehicle fuel leak, an electrical hazard, a bomb threat, a suspicious item, or other hazard, that constitutes a real or potential danger to any person.

Light-Duty Scaffold — A scaffold designed and constructed to carry a working load not to exceed 25 lbs. per square foot.

Lockout Device — a device that utilizes a positive means such as a uniquely keyed lock with the key kept under the control of the authorized employee to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Examples of acceptable lockout devices include, but are not limited to, blank flanges, bolted slip blinds, or other similar means.

Long Term Track Access Permit — access permit that allows Franchisee, Utilities Department, and OMC's maintenance contractors continuous access to the streetcar envelope to perform maintenance of infrastructure or equipment for one year but does not include construction.

Lubrication — the application of lubricants — generally on a scheduled basis — to equipment and machinery.



Machine — a device for power operation of switches, usually dual controlled for power or hand operations.

Machine, interlocking — an assemblage of manually operated levers or equivalent devices for the control of signals, switches or other units, including mechanical or electric locking or both to establish proper sequence of movements.

Maintenance — work performed by a Permittee on infrastructure or equipment which involves routine and scheduled access to the streetcar envelope to preserve the infrastructure or equipment in proper condition without significantly altering the infrastructure or equipment but does not include construction.

Malfunction — any anomaly wherein a system, subsystem or component fails to function as intended.

Mobile Device — any device with an on/off switch and a display screen. Includes but is not limited to cellular telephones, smartphones, pagers, scanners, iPods, personal computers, tablets, iPads, GPS devices, personal digital assistants (PDA), tablets, Apple watches, or other similar devices that transmit voice or data communications.

Mobile Scaffold — a powered or unpowered, portable caster or wheel-mounted supported scaffold.

Non-Revenue Preparation Hour — the one hour prior to the first Revenue Service Hour every day.

Non-Revenue Service Hours — all hours except for revenue service hours and the Non-revenue Preparation Hour. This is the period of time when the streetcar service is scheduled to be inactive and therefore not generating fare revenues.

Occurrence — an Event without any personal injury in which any damage to facilities, equipment, rolling stock, or infrastructure does not disrupt the operations of a transit agency.

OKC Streetcar System — the initial distance of the OKC Streetcar System, together with any extensions — of a fixed rail streetcar line, including streetcars, tracks, OCS, TPSS, platforms, facilities, and other related appurtenances, operated for public use within the boundaries of Oklahoma City.

Operating Envelope — an imaginary line depicting the area surrounding the streetcar track and overhead wire for which any activity that infringes upon this area requires Track Access Certification and a Track Access Permit. The envelope for the OKC Streetcar is defined as a 10-foot circumference from the center line of the track as well as a 10-foot circumference from the OCS. This imaginary pair of lines, which define the outside boundaries of the Operating Envelope, extend vertically up and down infinitely.

Operator of a public transportation system means a provider of public transportation as defined under [49 U.S.C. 5302\(14\)](#).

Permittee — the person, right-of-way user, or entity applying for or receiving a Long-Term Track Access Permit or a Track Access Permit to perform construction within the streetcar envelope under the terms and conditions of this procedure. The term includes: Any officer, director, partner, manager, superintendent, or other authorized person



exercising control over or on behalf of the Permittee, and any contractor or subcontractor of the Permittee.

Person — a passenger, employee, contractor, pedestrian, trespasser, or any individual on the property of a rail fixed guideway, bus, or ferry public transportation system.

Personal Protective Equipment (PPE) — all clothing and other work accessories designed to create a barrier against workplace hazards. Examples include safety goggles, blast shields, hard hats, hearing protectors, gloves, respirators, aprons and work boots.

Powered Industrial Truck (PIT) — any fork truck, industrial tractor, platform lift truck, motorized hand truck, or other specialized industrial truck powered by an electric motor or internal combustion engine. This definition does not include vehicles designed primarily for earthmoving or over the road hauling that have bucket-mounted forks.

PTASP — Public Transportation Agency Safety Plan. The comprehensive agency safety plan for a transit agency, including rail fixed guideway public transportation systems, that is required by Federal public transportation law ([49 U.S.C. § 5329\(d\)](#)) and based on a Safety Management System.

Qualified Person — a person familiar with the construction, operation, and hazards of the specific equipment involved and has training in avoiding hazards.

Rail Transit Agency — the organization or portion of an organization that operates rail transit service and related activities. Also called the operating agency, operating authority, transit agency, transit authority, or transit system.

Revenue Service Hours — the period of time when the streetcar line is scheduled to be actively conveying passengers, regardless of whether or not there is a fare for the transport service.

Right-of-Way (ROW) — lands or rights used or held for operation.

Risk — the composite of predicted severity and likelihood of the potential effect of a hazard.

Risk Mitigation — a method or methods to eliminate or reduce the effects of hazards.

Rolling Stock — transit vehicles such as buses, vans, cars, railcars, locomotives, trolley cars and buses, and ferry boats, as well as vehicles used for support services.

Safety Management System (SMS) — the formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of a transit agency's safety risk mitigation. SMS includes systematic procedures, practices, and policies for managing risks and hazards.

Safety Management System (SMS) Executive — a Chief Safety Officer or equivalent.

Scaffold — a scaffold is any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage) used for supporting employees, materials or equipment.

SDS — Safety Data Sheet - written or printed material concerning a hazardous chemical, which is prepared in accordance with [29 CFR 1910.1200 \(g\)](#).



Serious Injury — any injury which:

- Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received,
- Results in a fracture of any bone (except simple fractures of fingers, toes, or noses),
- Causes severe hemorrhages, nerve, muscle, or tendon damage,
- Involves any internal organ, or
- Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

Standard Operating Procedure (SOP) — a written document of fixed instructions to handle specific situations that promotes operational efficiency and effectiveness, safeguards assets and records, overcomes safety issues, provides quality control, declares or encourages adherence to policies, and assures total compliance with regulations.

State Safety Oversight — an agency established by a State that meets the requirements and performs the functions specified in [49 CFR Part 674](#). Oklahoma Department of Transportation (ODOT) performs these functions.

Station — a place designated for the purpose of loading and unloading passengers.

Streetcar — an electrically driven rail transit vehicle designed for local public transportation that runs on rails in mixed traffic at surface road grade, usually powered by an OCS.

Suspended Scaffold — the type of scaffold supported from above; it can be manually or power operated, and can be single-or two-point suspended.

Switch — a track device used to divert rolling stock from one track to another.

Tagout Device — a tag used in the Lockout/Tagout Procedure. Examples: *Danger, Do Not Operate, Do Not Start*.

Threat — any real or potential condition that can cause injury or death to passengers or employees, or damage to/loss of transit equipment, property, and/or facilities.

Toxic — a material that may cause death, permanent injury, and reversible or irreversible systemic changes in animals and humans.

Track Access Notification — a form to notify OMC personnel regarding any access to the streetcar envelope.

Track Access Permit — allows Permittee access to the streetcar envelope during the listed times for the specifically listed purpose.

Track Access Procedures — procedures followed by Franchisee, City, Event Coordinators and the OMC addressing construction or other activities affecting or conducted within the streetcar envelope.



Track Access Training — annual preparation provided by the SSM for all OMC personnel, emergency personnel or first responders, public service providers or Franchisees, and any others who will be working or performing an event within 10 feet of a TPSS or the streetcar envelope. Emergency personnel and first responders will require additional training pertaining to field operation. Refresher training must be taken annually in order to maintain certification to work on or adjacent to track.

Track Layout — an organized assemblage of track, the depiction thereof for control purposes.

Train — one or more passenger cars (including locomotives) coupled together and propelled by self-contained motor equipment. Also known as a consist which may be any one of the following:

- A locomotive and one or more passenger car as in the commuter rail (CR) mode,
- One or more heavy rail (HR) or light rail (LR) vehicles, or
- One vehicle only, if appropriate to that mode (e.g., cable car (CC)).

Unsafe Condition — any condition that endangers human life or property.

Vehicle — any rolling stock used on a rail fixed guideway public transportation system, including but not limited to passenger and maintenance vehicles.

Working Load — the load on the scaffold imposed by employees, material, and equipment.

Workplace — an establishment, job site, or project, at one geographical location containing one or more work areas.

Yard — a system of tracks within defined limits for making up trains and storing cars.



SECTION I - INTRODUCTION

1.0 WELCOME TO EMBARK

The Central Oklahoma Transportation and Parking Authority, dba EMBARK, provides bus, streetcar, ferry, bike share, and downtown parking solutions in the Oklahoma City metro area. Our transportation options connect people with their community, while easing traffic congestion and reducing air pollution. EMBARK serves an estimated 3 million riders annually.

Rules and requirements are adopted to protect EMBARK transit operations, including the proper manner of protecting the road, rail, and water rights-of-way. The rules and requirements are also adopted to protect signals, fiber optic cables, pipelines, other rights-of-way, and tenants or licensees upon, adjacent to, across (under, and/or over), and along EMBARK rights-of-way during the construction and/or maintenance activities on or adjacent to the rights-of-way.

This Contractor Safety Manual has been established to promote compliance with EMBARK's policies and procedures regarding site safety, health, environmental, and security standards. It also explains the responsibilities of Contractors and Franchisees working on projects and oversight relationships with EMBARK. Please note this manual is not intended to be a "How to do your job" but rather a tool to inform all employees on safety programs, rules, and processes required by EMBARK, OSHA, Federal Transit Administration, and other agency requirements.

Please read these procedures and make sure that you fully understand all sections. More importantly, use them to ensure the safety and wellbeing of your employees.

Safety is an essential integrated element at EMBARK. Each contractor is responsible for carrying out their responsibilities under the law. As a contractor, you are expected to maintain these high standards.

Thank you for your cooperation!

QUESTIONS?

Please contact the Chief Safety Officer at 405-297-2517

SIGNATURES



Jason Ferbrache
Accountable Executive

11/08/2022

Date:



Eugene Fritz
Chief Safety Officer

11/08/2022

Date:

Jesse Rush
Asst Director of Operations

11/08/2022

Date:

Suzanne Wickenkamp
Asst Director of Administration

11/08/2022

Date:

Dennis Fry
Facilities and Maintenance Manager

11/08/2022

Date:

Joel Garcia
Streetcar Manager

11/08/2022

Date:



1.1 Scope and Purpose of Manual

The purpose of this manual is to prevent work related incidents and adverse events. This Contractor Safety Manual describes elements that all Contractors, Subcontractors (at every level) and Franchisees must include in their safety program. This manual is not all-inclusive. Other elements may be added or conveyed individually to Contractors to whom they expressly apply. Some Contractors, by nature of the specific type of work being performed, must integrate other essential elements within their own safety program.

For the purposes of this manual, a contractor is an individual, firm, third party, franchisee, partnership, or corporation, or combination thereof, private, municipal, or public, including joint ventures, retained by EMBARK or another public entity to provide construction or maintenance services which may impact EMBARK operations, employees, and the public. From this point forward, Contractors, subcontractors and Franchisees will be referred to as “Contractor”.

The role of Contractor Safety Management in achieving contractor safety and health includes the oversight for project safety. This Manual sets forth basic responsibilities, guidelines, rules, and regulations for all personnel involved in construction, projects, and services at EMBARK. The intent is to enhance and supplement any safety and health standards that are required by contract documents, or by law, and are applicable to EMBARK construction, projects, and services.

This Manual does not cover the full spectrum of published safety and health standards that are mandated by law. Consequently, Contractors shall not assume that they are responsible only for those standards which are referenced in this Manual, or that those standards are current and quoted as published. It is the Contractor’s responsibility to FULLY BE RESPONSIBLE FOR SAFETY. This requirement shall apply continuously and is not limited to normal working hours. Nothing that EMBARK may do, or fail to do, with respect to safety in the performance of the Work shall relieve Contractor of their sole responsibility for the safety, efficiency, and adequacy of the Contractor’s plan, appliances, and methods, or for any damage or injury resulting from their failure, or improper maintenance, use of operation. The key function of Contractor Safety Management, as it relates to Contractor safety and health, is to monitor Contractor compliance with safety and health standards required by law.

In the event of a conflict between the provisions of this Manual and applicable local, State, or Federal safety and health laws, regulations and/or standards, or contract documents, the more stringent shall apply, provided, under no circumstances shall the provisions of this Manual require a contractor to violate applicable local, state, or federal law. Contractor Safety Programs must be at least as stringent as EMBARK’s safety programs as well as in compliance with all applicable Federal, State, and local regulations and ordinances. Nothing in this manual should be construed to be a substitute for full regulatory requirements. This Manual is subject to revisions and updates as necessary.



1.2 Goals and Objectives

The goal of this manual is to establish and maintain a safe working environment for EMBARK's employees, contractors, visitors, the public, and the environment. The four core values at EMBARK are "Be Safe, Be There, Be Open, and Be Kind." It is the responsibility of everyone to respect these values and assist in accomplish the following objectives:

- Enhance Contractor safety awareness associated with construction work, project and service activities to employees, contractors, visitors, the public, and the environment.
- Establish and maintain a hazard risk assessment system that promptly identifies and corrects unsafe practices or conditions.

1.3 Safety Management Policy Statement

EMBARC is to be an effective participant in the continuing development of a high-quality, livable environment in the City of Oklahoma City by enhancing mobility, supporting economic development, and delivering safe, reliable, clean, cost-effective transit service. EMBARK is Oklahoma City's public transit agency responsible for the operations and maintenance of transit operations. EMBARK is committed to developing, implementing, maintaining, and constantly improving processes to ensure that all our transit service delivery and maintenance activities take place under a balanced allocation of organizational resources, aimed at achieving the highest level of safety performance and meeting established standards. Process improvement will be achieved in various ways with the regular, ongoing audit of key elements within the Public Transportation Agency Safety Plan serving as the most formal approach.

All levels of management and all employees are accountable for the delivery of this highest level of safety performance, starting with the Accountable Executive. The Accountable Executive may delegate specific responsibilities, but the ultimate accountability for EMBARK's safety performance cannot be delegated and always rests with the Accountable Executive.

1.4 Authority

The Central Oklahoma Transit and Parking Authority (COTPA), dba EMBARK, is a trust established by the City of Oklahoma City (City), whose sole beneficiary is the City of Oklahoma City, and is responsible for the operation of transit services.

In addition, the Federal Transit Administration (FTA) administers a national transit safety program and compliance oversight process to advance safe, reliable, and equitable transit service throughout the U.S. FTA's Transit Safety Oversight (TSO) Office helps make transit safer through policy development, hazard investigation, data collection, risk analysis, oversight programs, and information sharing.



2.0 EMERGENCY RESPONSE AND ACCIDENT REPORTING

1. Prior to starting work, the Contractor must provide the contract liaison with the emergency phone numbers for the Project, including the contractor's Safety Officer, EIC, and Project Foreman/Superintendent.
2. In emergency situations the following applies:
 - a. Immediately report to the contract liaison or EMBARK EIC any adverse events, accidents, personal injuries, vehicle accidents, defects in tracks, bridges, signals, utilities or communication facilities, security incidents, or any unusual condition that may affect the safe operation of EMBARK Transit operations.
 - CALL 9-911 from an EMBARK telephone
 - 911 from any other phone.

Note: Calling 911 from a cell phone may cause delays. Be sure to know your location.

- b. In case of fire, injury, or emergency at any EMBARK project, facility, or location, contact emergency services at the numbers listed and provide all details. Stay on the line. In the event of a fire, evacuate the area by following your emergency evacuation plan. In the event of injury to personnel, provide assistance as applicable. In either situation, provide an individual or individuals to guide emergency response personnel to the site. The Contractor is responsible for reporting pertinent information to the arriving emergency response personnel.
- c. If equipment was involved in the incident, it must not be moved until examined to ensure the equipment was in proper working condition, unless movement is necessary to prevent further injury or risk to persons or property.
- d. After calling 911/applying first aid – (if necessary), in case of personal injury, loss of life, or damage to property, the contractor's EIC must immediately document the names, addresses, and occupations of all persons involved, including all persons at the scene regardless of whether these persons give a statement about the incident. This information should be included in the incident reports.
- e. If an incident causes personal injury or death, all tools, machinery, and other equipment involved, including premises where such accident occurred, must be promptly inspected by the contractor's EIC. Tools, equipment, and machinery must be secured until the contractor's EIC, Safety Officer, or other competent person has completed an inspection. A report of such inspection, stating the conditions found and names of persons making the inspection must be promptly forwarded to EMBARK and the supervising officer of the person making the inspection.



- f. Information concerning incidents or personal injuries occurring to persons who are not employees, must not be given to anyone except authorized representatives of EMBARK or an officer of the law.
3. EMBARK is a part of and utilizes the National Incident Management System (NIMS). NIMS guides all levels of government, nongovernmental organizations and the private sector to work together to prevent, protect against, mitigate, respond to and recover from incidents. If an emergency scene requires a response from EMBARK personnel and/or multiple agencies, the NIMS system will be utilized.
4. Immediately after 911 is called, or in the event the occurrence does not require a 911 response, notify your Contract Liaison. In the advent that the Contract Liaison is not immediately reachable contact the CSO at:
 - Chief Safety Officer: 405-297-2517

2.1 Hazardous Material Spill

1. When a potential or actual spill emergency is detected within the EMBARK system, it must be immediately reported. The personnel reporting the spill must provide full information including if any exposure or injury has occurred.
 - Contract Liaison
 - Chief Safety Officer: 405-297-2517
2. In case of a chemical or fuel spill on water notify the Chief Safety Officer who in turn will notify the US Coast Guard.
3. Bloodborne pathogens or other potentially infectious materials as defined by [29 CFR 1910.1030](#) will be reported to your Contract Liaison and/or the Chief Safety Officer.
4. Only trained personnel may respond to a hazmat spill emergency.
5. Before handling hazardous materials, properly trained EMBARK personnel will perform an evaluation of the spill and make a determination on how EMBARK and the Contractor shall proceed.

2.2 Emergency Action/Evacuation Plans

Contractors governed by OSHA are responsible for preparing and implementing on-site plans covering the actions that personnel must take to ensure worker safety in the event of severe weather conditions, natural disasters such as earthquakes, transit emergencies, higher security alert statuses, and construction related emergencies. The elements of this plan include:

1. Emergency escape procedures and emergency escape route assignments,
2. Procedures for employees who remain to operate critical equipment before they evacuate,



3. Procedures to account for all employees after an emergency evacuation,
4. Rescue and medical duties for employees who perform them,
5. The preferred means of reporting fires and other emergencies,
6. Names and job titles of persons who can be contacted for further information or explanation of duties under this plan.
7. The plan shall be posted in a conspicuous location and shall include primary and secondary locations/assembly points where Contractor personnel will meet following such conditions and how personnel will be accounted for.
8. The Contractor shall advise employees of these assembly points at their initial safety orientation.
9. All inquiries from the media regarding any incident occurring on the site shall be referred to the contract liaison or EMBARK's Public Information Officer.

2.3 First Aid and Medical Attention

1. Contractors must ensure that a system is in place to provide adequate first aid to workers who are injured or become ill at work.
2. Contractors are responsible to ensure that first aid supplies and first aid-trained personnel are available to employees working a job that may not be in near proximity to emergency medical personnel (i.e., more than 4 minutes response time away from the work site).
3. Contractors are also responsible to ensure that personnel have appropriate training, that CPR and First Aid certifications are up to date, and that each employee understands the 911 emergency notification procedure for emergency situations and will provide the names to the CSO upon request.
4. Workers are to understand that offering first aid to another employee is voluntary unless their job description requires it.
5. Any event requiring first aid shall be documented.

2.4 Emergency Right-of-Way Access

1. Emergency work in the bus, streetcar, or water right-of-way must comply with EMBARK and OMC policies and procedures. Emergency work may be performed at any time to the extent necessary. Right-of-way access during an emergency must terminate upon the resolution of the emergency.
2. To the extent reasonably practicable, emergency work will be performed within the right-of-way envelopes to avoid disruption to operations.
3. The OCC/Dispatch must be notified before the start of any emergency work.
4. First responders (OKCPD, OKCFD or public utilities) must contact the OCC/Dispatch, advise of the location of the emergency work, and provide a brief description of the work to be performed.
5. The CSO or designee will respond to all emergency requests.



3.0 GENERAL REQUIREMENTS OF THE CONTRACTOR

3.1 Scope and Purpose

All Contractors shall be committed to the goal of accident prevention. To achieve this goal, the safety and health of all personnel must receive primary consideration in the planning, scheduling, and execution of the work.

3.2 Guidance

The Contractor assumes full and sole responsibility for the onsite safety of its employees performing work under this program. All Contractors under contract with EMBARK performing construction or construction-related activities on EMBARK properties and rights-of-way are responsible for compliance with site safety policies and procedures and are directly responsible for the safety of their employees and those of their subcontractors.

Contractor General responsibilities include:

1. Submittal of a copy of their Site-Specific Safety and Health Program to the EMBARK CSO. The Contractor is also responsible for the submittal and review of their sub-tier contractor programs. Small business contractors as defined by OSHA may adhere to EMBARK's or the OMC's safety programs and policies per agreement with EMBARK and/or the OMC.
2. Ensuring that all Subcontractors and sub-tier contractors working under their direction comply with all applicable laws, regulations, ordinances, conditions of the contract, or orders of any public authority having jurisdiction relating to the safety of persons or property.
3. Checking for and correcting any unsafe practices and conditions that exist in the performance of their work and reporting to the CSO or designee any unsafe conditions created by others.
4. Employing a qualified Site Safety Representative at the site whose duties include the protection of persons and property and administration of the Contractor's safety program. The contractor's EIC can serve as the Site Safety Representative.
5. Reviewing the safety program of all subcontractor and sub-tier contractors performing work on their project prior to that work beginning.
6. Performing daily inspections of the project and correcting substandard safety conditions and practices. These inspections shall be documented.
7. Explaining how existing underground utilities will be located and protected. Identifying each utility owner and including contact information for each company/agency in a master plan or list. Addressing emergency response procedures for damaged or disrupted utilities.
8. Not allowing alcohol, drugs, and weapons onsite under any circumstances and will immediately remove any employee who violates this rule.



9. Having a Substance Abuse Prevention Program and ensuring compliance for Subcontractors.
10. Keeping the workplace clean, and handling, daily, debris generated by the work.
11. Properly train and instruct in all jobs which require specific training and/or competency to meet all applicable OSHA regulations and standards, Local, State, and Federal laws, and the requirements herein.
12. Where regulations require the designation of “Competent Person” the Contractor shall submit the names of those individuals, their qualifications and/or certifications, and the discipline they are deemed competent in. These disciplines include but are not limited to welding, electrical, scaffolding, erection, and underground construction.
13. Prior to the performance of any work, all Contractor employees shall be instructed as to the hazards, rules, and requirements that apply to the work they are to perform.
14. Supervisory personnel shall require all employees working under their supervision to comply with all applicable safety rules.
15. The Contractor shall not tolerate practical jokes, horseplay, fighting, or unnecessary risk taken by employees.
16. Immediate reporting of unsafe acts or conditions observed that are not under their control to the CSO to ensure abatement.
17. Making 72-hour notification to the EMBARK representative prior to any work involving water systems, water lines, or fire alarm systems.
18. Notifying the CSO immediately in the event of a site inspection by OSHA to ensure EMBARK’s representation at such meetings or inspections. Copies of any documentation, citations, or correspondence received from OSHA concerning the visit shall be forwarded to the CSO.
19. Meeting with the CSO Within 48 hours of a Recordable or Lost Workday Case Injury, incident involving a third party, or property damage incident. The meeting shall discuss the status of the injured employee, the root cause of the incident, corrective action implemented, the Job Hazard Analysis, and retraining of the employee and supervisor.
20. No modifications or additions, which affect the capacity or safe operation of equipment, shall be made without the manufacturers or professional engineers’ written approval.
21. Providing proper lighting and illumination of work areas.
22. Employees shall avoid working, driving, or walking under suspended loads.
23. Post, observe, and comply with Safety, Danger, Warning, and Caution tags or signs. Tags and signs shall not be removed unless authorized.



24. Makeshift work platforms such as 5-gallon pails or crates shall not be utilized.
25. Graffiti of any type will not be tolerated on the project.



SECTION II – SAFETY and HEALTH GUIDANCE

4.0 SAFETY ORIENTATION, TRAINING AND MEETINGS

4.1 Scope and Purpose

Safety education and job training are a critical part of hazard recognition and control. Safety education should help employees understand why personal safety is important. Employees must be trained in all requirements, rules, and regulations of their job if a hazard does or could exist from personal exposure to machines, tools, energized equipment, hazardous chemicals, vehicular traffic, or work practices. This section defines the minimum safety training requirements for all Contractor personnel working on EMBARK properties and projects.

Safety Orientation and Training will be conducted to inform contractor employees and their subcontractors of safety and health rules and regulations. Safety and health rules and regulations are addressed by [29 CFR Parts 1910](#) and [1926](#), ANSI, NFPA, FTA, and local ordinances, rules, and regulations. This list is not meant to address all rules and regulations.

4.2 Training

The Contractor shall:

1. Provide orientation and required safety training including any required refresher training to employees in reference to the work being performed and applicable OSHA regulations.
2. The Contractor shall ensure that sub-tiered contractors also perform this training.
 - a. It is the responsibility of the Contractor to maintain detailed records of training for their employees.
 - b. It is also the responsibility of the Contractor to ensure that safety rules, procedures, and requirements are effectively conveyed to non-English-speaking personnel.

All Contractor and Consultant personnel, regardless of shift, working on EMBARK construction projects shall receive a site safety orientation prior to commencing work. Attendees will receive a safety handbook and be apprised of site-specific safety procedures.

Quick Reference

[OSHA Publication 2254, Training Requirements in OSHA Standards](#)



5.0 SAFETY MEETINGS

5.1 Scope and Purpose

Employee Safety Committees are an effective tool for managing and furthering the promotion of workplace safety and health at the front-line employee level. All employees will attend some form of safety meeting. Tailgate or Toolbox safety meetings are 10-15 minute on-the job meetings for employees in the construction industry. These meetings allow supervisors to draw on the experience of employees and use that experience to remind them of the dangers of construction processes, tools, equipment, and materials.

5.2 General

1. Safety meetings are required of all Contractors. The meetings can be conducted as a Tailgate and/or formal Safety Committee meeting.
2. At a minimum the meetings will include:
 - a. Address the specific hazards and safe work practices for the work tasks that employees will be performing
 - b. A review of safety and health hazards as listed on inspections
 - c. An evaluation of incidents and adverse events to determine if the cause of the unsafe act or condition was properly identified and abated.
3. Upon request, minutes of safety meetings and the names of those attending shall be documented and submitted to the Chief Safety Officer.
4. Contractor/ EMBARK meetings:
 - a. It is a requirement that the Contractor's Site Safety Representative attend Contractor meetings scheduled by the contract liaison. This meeting is held to discuss and resolve relevant issues related to the project as well as safety and health.
5. Contractor Safety Representative Meeting
 - a. It is a requirement of Safety Management that the Contractor's Site Safety Representative attend the monthly Contractor Safety Representative Meeting scheduled by the Contract Liaison. This meeting is held to discuss and resolve relevant issues related to safety and health on EMBARK construction projects. If the Contractor's Safety Representative cannot attend this meeting, they shall send a designee in their place.
 - b. It is the responsibility of the Contractor Safety Representative to review the pertinent information from this meeting at their worksite.



6.0 PERSONAL PROTECTIVE EQUIPMENT

6.1 Scope and Purpose

EMBARK and Contractor employees are to be protected from risk of injury by engineering controls, administrative controls, and work practices. However, there are times when these controls are not sufficient, and personal protective equipment (PPE) must be utilized.

This section establishes procedures required to protect EMBARK and Contractor employees or who supervise employees who work in areas where physical hazards or the potential for physical hazards exist, by assessing the possibility of hazards and providing the appropriate PPE, including hearing, body, respiratory, eye, face, head, foot, hand, and arm protection.

The purpose is to reduce or eliminate the potential of injury to Contractor and EMBARK employees performing work on EMBARK projects and to visitors and the public.

6.2 Guidance

1. Contractors will conduct a walk-through survey of each work area to identify potential hazards. The Contractor shall submit a written PPE Assessment for work performed on the project. Reference the Job Hazard/Safety Analysis section: 7.0
2. If a Job Hazard Analysis (JHA) does not exist, each survey will be documented using EMBARK's [Job Hazard Analysis Form \(SA-FRM-614.00.01\)](#) or an equivalent form. The JHA should be dated and signed as the written certification and maintained for inspection and employee training.
3. **NOTE:** The PPE assessment form may be incorporated within the JHA to identify specific PPE required for the task(s) and/or the personal protective equipment assessment could be incorporated within the JHA if each task is specific to required PPE for that task.

6.3 Hard Hat Policy

1. All employees are required to wear approved, non-metallic hard hats while on an active construction work site at all times. This includes Contractors, subcontractors, vendors, suppliers, and visitors.
2. Hard hats are designed, tested, and certified to be worn in only one position — with the liner securely in place and the bill turned forward.
3. The only time employees are allowed to “reverse” their hard hats is when their work creates an absolute need to turn the hat backwards. For example, when welding hoods or face shields are designed to attach to the backside, when connectors are receiving a hoisted load, or when surveyors are looking through a transit or level.



4. To provide full protection in those situations the suspensions shall be reversed. When those tasks are completed, the hard hats are to be restored to their correct positions.
5. All protective headgear shall meet the requirements of ANSI Z89.1-1986. The use of “Cowboy” type hardhats is prohibited unless they comply with the current ANSI standard.

6.4 Face Protection Policy and Safety Glasses/Goggles Policy

1. All employees will wear safety glasses or goggles as required while on the work site.
2. Full-face protection, as provided by a face shield, shall be required at all times when potential injury to the face itself exists. Work activities that require use of full-face shields include, but are not limited to, grinding, “housekeeping blow downs” using compressed air, chipping concrete, cutting metal decking, using chain saws, handling toxic or corrosive chemicals or liquids, using power-actuated tools, certain instances of drilling, and using jackhammers or air hammers.
3. During steel erection activities including reaming, drilling, welding, and cutting, the use of a face shield does not preclude the requirement to utilize eye protection under it.

6.5 Footwear

1. Footwear made of leather or other equally firm material in the form of work shoes or boots shall be worn by all individuals while on the project site.
2. The type of footwear use will be determined by [SA-SAP-600.18 Personal Protective Equipment](#) or a job hazard evaluation, whichever is more stringent.
3. Protective footwear shall comply with [ANSI Z41-1991](#).
4. Traditional tennis shoes, shoes with canvas tops, or thin or soft sole athletic shoes, open toed sandals, slippers, dress shoes, or other similar type shoes shall not be worn.
5. Employees engaged in the use of soil compacting equipment shall utilize metatarsal protection.

NOTE: Footwear appropriate for the task may be worn during performance of the task, i.e.: rubber boots during concrete placement or wet, muddy conditions and ice cleats that fit over existing footwear for ice and snow conditions.

6.6 Hearing Protection

Hearing protection shall be worn when working in areas posted as hazardous noise areas, or when working around or using equipment that presents high noise hazards as identified through the Contractor’s Hearing Conservation Program.



6.7 Apparel

1. All employees working on the site exposed to vehicular traffic, heavy equipment, or involved in low light or night operations shall wear highly visible or reflective garments as prescribed by ANSI.
2. Personnel utilizing chain saws shall wear eye, face, hearing, and leg protection.
3. Contractor personnel engaged in the cutting, welding, or scarfing of steel shall utilize a welding hood or tight-fitting goggles combined with a face shield. The protection shall be of the proper shade as required by ANSI.
4. Contractor personnel shall wear personal floatation device within 6' of any exposure to falling into water where the potential for drowning exists.

6.8 Hand Protection

1. To reduce the possibility of hand injuries, the Contractor shall ensure that all employees working under their control, including subcontractors and sub-tiers, utilize gloves. It is the responsibility of the Contractor to supply the proper glove for the task and train the employees in relation to [29 CFR 1910.138](#) and [29 CFR 1926 Subpart E](#).
2. When the Contractor feels a greater risk of injury is imposed by the use of gloves, or the glove may require modification to perform a given task, it shall be documented on the [SA-FRM-614.00.01 Job Hazard Analysis Form](#). Final selection of the best hand protection is the responsibility of the Contractor.
3. Electrical gloves shall meet the electrical and physical requirements contained in [ASTM D 120.87 Specifications for Rubber Insulating Gloves](#) and [ASTM F 496-93b Specification for In-Service Care of Insulating Gloves and Sleeves](#).
4. Retesting of insulating gloves shall be electrical, visual, and mechanical. The retesting interval is dependent on the type of insulating glove and if the glove is new or re-issue.
5. Electrical gloves shall be marked to indicate compliance with retest schedule and with the date the next test is due. Electrical gloves shall be visually inspected prior to each day's use. Regulatory reference: [29 CFR 1910.137, 138](#).

6.9 Appropriate Project Attire

The following minimum dress requirements apply to all employees, Contractors, Subcontractors, Vendors, and Visitors:

1. Tank tops, net shirts, cut-off shirts, or sleeveless shirts may not be worn. At a minimum, employees are required to wear a shirt top that is comparable to a T-shirt. Shirts must have a sleeve that covers the ball of the shoulder in the same manner as a T-shirt with a sleeve at least 4 inches long.



2. Pants must be full-length.
3. Shorts, skirts, and other such apparel are not permitted.
4. Clothing must not hang loose to the point where it can be caught in parts of moving machinery.
5. Employees who perform welding and cutting, operate rotating machinery, or are exposed to chemicals, fire, or other such hazards, must contain their beards and hair to a point where there is no danger of their hair catching fire, dipping into chemicals, or being caught in rotating machinery.
6. Jewelry should be discouraged from being worn while working.

6.10 PPE Cleaning and Maintenance

1. It is the employee's responsibility to ensure their PPE is clean and properly maintained. Cleaning is particularly important for eye and face protection, where dirty or fogged lenses could impair vision. PPE should be inspected, cleaned, and maintained at regular intervals as instructed by the supervisor.
2. Contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards.

6.11 Training

1. Training shall be provided to employees working in an area requiring the use of PPE.
2. Additional training is needed when changes in the employee's job duties require different PPE, changes in the style or type of PPE used renders previous training obsolete, an event has occurred which indicates the affected employee has not retained the training on proper use of PPE, or when the employee is observed using assigned PPE incorrectly.
3. Upon request, a training certificate containing the name of the employee trained, dated of training, and the specific PPE covered in the training shall be provided to EMBARK's CSO.

Quick Reference

[OSHA Publication 2209-07R 2021, Small Business Safety and Health Handbook](#)

[29 CFR 1910 Subpart I Personal Protective Equipment](#)

[29 CFR 1926 Subpart E Personal Protective Equipment](#)



7.0 JOB HAZARD/SAFETY ANALYSIS

7.1 Scope and Purpose

The Contractor shall complete a written Job Hazard Analysis (JHA) for work to be performed, outlining the equipment to be used, the identified hazards that may exist or be created, and what procedures or safety equipment will be used to eliminate or reduce those hazards. Completed JHAs are to be reviewed with the workforce and shall contain their signatures as an acknowledgement. It is the responsibility of the Contractor to ensure subcontractors and sub-tiered contractors are completing written JHAs. The Contractor may use the form provided in this manual.

7.2 Guidance

Use this analysis to reduce hazards and to train workers in safe procedures. To accomplish these objectives the contractor should:

1. Understand the objectives and means of analyzing jobs element by element
2. Establish a plan for analyzing job elements on a regular basis
3. Analyze statistical data, accident experience, and management and employee experience to develop the sequence of job elements
4. Devise an action plan to control hazards identified with a timetable for implementing the plan
5. Have supervisors AND employees review the results of all JHAs covering job elements for which they have supervision
6. Provide supervisors with a copy of all approved safe job procedures developed as a result of a JHA
7. Train workers in accordance with the conclusions of the JHA both initially and each time the task is analyzed
8. Have supervisors regularly observe the workers and ensure they follow safe work practices
9. Give supervisors the authority and responsibility to enforce adherence to safe work habits.

In practice, the person conducting the JHA must be competent, qualified and practical in assessing each job element, and follow a management-approved breakdown of each job to be analyzed.

As you conduct the JHA, it is important to search for the hazards of each element — whether produced by the environment or connected with the job procedure. When properly and thoroughly done, this will assist in making the entire job safer and more efficient.



7.3 Safety Observations

The following are key elements required for good safety observations:

1. Make safety observations when you can concentrate all of your attention on safety,
2. Observe the work area, making mental and written notes of any potentially dangerous situations or conditions,
3. Whenever possible, take immediate corrective action to prevent reoccurrence.

It is always good practice to observe the way employees perform their jobs. However, planned safety observations are much more effective because they focus your attention on the safety aspects of the job, thus pointing to those conditions requiring immediate correction.

7.4 Non-Routine Tasks

A non-routine task is one not normally performed as part of a job assignment. Prior to starting work on such a task, give each affected employee information concerning the hazards they will be exposed to. The immediate supervisor will be responsible for determining what hazards may be present and/or created, and for communicating this information to appropriate employees. This information will include, but is not limited to:

1. Specific hazardous conditions
2. Protective/safety measures the employee must take, including special equipment
3. Measures the company has taken to lessen the hazards.

Upon the completion of each non-routine task, document and distribute to all supervisors all information concerning the hazards encountered during the task. This will ensure that the proper information concerning this task will be properly communicated to the affected employees. Keep this documentation on file for future reference.

Employer Responsibilities (OSHA Standard: General Duty Clause)

Under the General Duty Clause, Section 5(a)(1) of the Occupational Safety and Health Act of 1970, employers are required to provide their employees with a place of employment that "is free from recognized hazards that are causing or likely to cause death or serious harm to employees." The courts have interpreted OSHA's general duty clause to mean that an employer has a legal obligation to provide a workplace free of conditions or activities that either the employer or industry recognizes as hazardous and that cause, or are likely to cause, death or serious physical harm to employees when there is a feasible method to abate the hazard. This includes heat-related hazards that are likely to cause death or serious bodily harm.



8.0 RESPIRATORY PROTECTION

8.1 Scope and Purpose

Respiratory protection shall be worn when performing tasks that expose personnel to dust, gases, mists, vapors, fumes, or oxygen deficiencies. Examples of those operations would be drilling, grinding and chipping concrete, welding, painting, sandblasting, and other operations where dust hazards exist. As with other PPE, respirators are used only when administrative and/or engineering controls are inadequate.

NOTE: Dust masks or cartage type respirators do not protect employees in oxygen deficient atmospheres.

This section establishes minimum parameters for Contractors to ensure a viable, continuing, effective respiratory protection program that provides for the safe use of respirators. Contractors must have a respirator program that meets all elements of [29 CFR 1910.134 Respiratory Protection](#).

8.2 Guidance

1. Contractors will have a written plan that contains worksite-specific procedures and elements for required respirator use, and that plan shall be given to EMBARK prior to the work being conducted.
2. Respirators are an effective method of protection against designated hazards when properly selected and worn. If the Contractor provides respirators for voluntary use, or if a worker provides their own respirator, precautions need to be taken to ensure that the respirator itself does not present a hazard.
3. Respiratory protection must be worn when the SDS, product labeling, or onsite instrumentation indicates that it must be worn.
4. Choose respirators certified for use to protect against the contaminant of concern. A label or statement of certification will appear on the respirator or packaging, indicating what the respirator is designed for and how much it will protect the wearer.
5. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning, care, and warnings regarding the respirator's limitations.
6. Do not wear a respirator into atmospheres containing contaminants for which the respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect the wearer against gases, vapors, or very small solid particles of fumes or smoke.
7. Employees who are not medically cleared to wear respiratory protection may not wear respiratory protection.



8.3 Medical Evaluation (Sample Procedure)

1. Workers shall have a medical evaluation to determine their medical status as it relates to respiratory protection, and to ensure they are physically able to perform the work while wearing a respirator.
2. Medical examination will consist of:
 - Completion of respiratory questionnaire.
 - Pulmonary function test.
 - Physical examination.
 - Review annually the medical status of all employees who use respiratory protection
 - Only medically approved employees will receive training in respiratory protection.

8.4 Training

1. Workers who may use a respirator shall be given training with respect to the respirator being worn.
2. Training must precede the use of a respirator. Retraining is required annually and whenever necessary to ensure safe use. Contractors shall ensure their employees and sub-contractors comply with all the elements of [29 CFR 1910.134](#).
3. At a minimum the training program should include:
 - a. The purpose of respiratory protection
 - b. Types of protection available and the limitations of each type
 - c. How to properly don the equipment and check the fit
 - d. How to properly clean, inspect, and store the equipment
 - e. How to select the correct filter and how to determine the limitations of the filter
 - f. Discussion of the Contractor's written respiratory program.
 - g. Provide all employees the opportunity to wear the respirator for 15 minutes before the face fit-testing procedure.



9.0 HAZARD COMMUNICATIONS

9.1 Scope and Purpose

The purpose of **29 CFR 1910.1200 Hazard Communication** is to ensure employees are aware of and protected from hazardous substances in the workplace. It requires employers to evaluate the presence and potential hazards of chemicals and other substances employees may be exposed to in their workplaces.

The hazard communication standard requires employers to prepare and implement a written procedure detailing how they will accomplish the standard's requirements. This plan should include company-specific means to accomplish the objectives set out by the topics included in the regulations. This section is not a complete plan but rather highlights elements of the plan and procedures.

The plans must be available to all employees, employees' designated representatives and EMBARK.

Contractors generally share a work site with a number of other employers. The standard requires the exchange of information among employers concerning hazardous substances brought onto the work site that may pose a hazard to on-site personnel other than their own employees. This exchange should include:

1. Substances to be stored or used on site
2. Hazards to which other employers' workers may be exposed
3. Methods that other employers can use to protect their workers
4. Other employers' access to the appropriate SDS for the hazardous substances.

9.2 Safety Data Sheet (SDS)

1. A Safety Data Sheet (SDS) describes a single substance, such as gasoline, or a mixture of substances, like concrete, and must include the following information:
 - a. Substance name, both chemical and common
 - b. Chemical and physical characteristics, including appearance and odor
 - c. Physical and health hazards
 - d. Primary routes of entry into the body
 - e. Recommended and required exposure limits
 - f. Known control measures
 - g. Measures to protect workers during use or cleanup of the substance
 - h. First-aid measures to be used in case of accidental exposure
 - i. Name, address, and telephone number of the SDS preparer or distributor, and the date prepared.



2. Employers must present this information to employees through training, SDS's, labels, and other means of identification.
3. An SDS for a substance containing a mixture of ingredients must include the chemical and common names of ingredients amounting to 1 percent or more when it constitutes a health hazard, or 0.1 percent if the ingredient is a carcinogen. New information about hazards or protective measures must be disseminated by the manufacturer or distributor.
4. All Contractors shall submit an SDS on any hazardous substance brought onto EMBARK property. Prior to bringing materials on site, the SDS's shall be submitted to the EMARK Safety Department for review and documentation purposes, as specified in the contract. The SDS's shall be the most current edition and no more than 3 years old.
5. Maintain copies of SDS's in a central file and also in the area where workers use the substance. Have SDS files easily accessible to employees at all times while they work with the substances. Use the SDS to determine whether the substance is hazardous. Guidance for this determination is contained in [29 CFR 1910 or 1926, as appropriate](#).

9.3 Training

Training is required for all workers who have an exposure or a potential for exposure to hazardous chemicals. They must be trained prior to initial exposure and when a new chemical hazard is introduced. Contractors shall ensure their employees and sub-contractors comply with all the elements of [29 CFR 1910.1200](#) and [29 CFR 1926.59](#).

Quick Reference

[29 CFR 1926.59 Hazard Communication](#)

[29 CFR 1910.1200 Hazard Communication](#)



10.0 HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

10.1 Scope and Purpose

Contractors shall comply with a safety and health program that meets **29 CFR 1910.10** for their employees involved in hazardous waste operations.

The purpose is to ensure the safety and health of employees and the public and protect the environment.

10.2 Guidance

1. Construction activities that pose a potential risk of exposure to contaminated soil (such as excavations) shall be supervised by personnel who have both a current 40-hour Hazardous Waste certification, and an 8-hour Hazardous Waste Supervisor's certification.
2. These individuals shall be able to identify the potential need for upgrading the level of health and safety protection.
3. All personnel working in direct contact with contaminated soil shall have a current 40-hour Hazardous Waste certification and medical monitoring in accordance with OSHA regulations.
4. The plan shall also include emergency procedures and medical treatment, fire protection, Job Hazard Analysis (JHA), and PPE requirements.
5. The Contractor is responsible for soil sampling and air monitoring to determine hazards and exposures to their employees.
6. Hazardous waste operations and emergency response efforts shall be coordinated with the contract liaison.



11.0 FALL PROTECTION

11.1 Scope and Purpose

Falls are complex events involving a variety of factors. Consequently, the standard for fall protection deals with both the human- and equipment-related issues in protecting workers from fall hazards. The fall protection rule identifies areas or activities where fall protection is needed. It also clarifies what employers can do to provide fall protection for employees, such as identifying and evaluating fall hazards and providing specific training.

The fall protection rule sets a uniform threshold height of 6 feet for construction and 4 feet for general industry. This means employees must be protected from fall hazards and falling objects whenever an employee is on a walking/working surface 4 or 6 feet or more above a lower level. The 1926 rule covers most construction workers except those inspecting, investigating, or assessing workplace conditions prior to the actual start of work, or after the completion of all work.

11.2 Guidance

1. The contractor shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.
2. Each employee on a walking/working surface with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems. [29 CFR 1926.501 \(b\)\(1\)](#)
3. Each employee on a walking/working surface 6 feet (1.8 m) or more above a lower level where leading edges are under construction, but who is not engaged in the leading-edge work, shall be protected from falling by a guardrail system, safety net system, or personal fall arrest system. If a guardrail system is chosen to provide the fall protection, and a controlled access zone has already been established for leading edge work, the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.
4. Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes.

11.3 OSHA Fall Protection Guidance Between 1910 and 1926

Other OSHA regulations cover fall protection requirements for workers on scaffolds, cranes and derricks, steel erection, equipment used in tunneling, electrical transmission and distribution lines, and stairways and ladders. Use the appropriate regulation for your industry.



NOTE: [29 CFR 1910](#) and [29 CFR 1926](#) standards are not interchangeable. Refer to OSHA letter of interpretation ([1926.106, 9/28/1999](#)) for Fall Protection Requirements Over Water. Other specific fall protection requirements can also be found within this manual.



12.0 HAND AND POWER TOOLS

12.1 Scope and Purpose

Every Contractor is required to ensure that all employees adhere to either **29 CFR 1910 Subpart P** or **29 CFR 1926 Subpart I** (as appropriate), and state, local, and EMBARK requirements; when requirements are in conflict Contractor must adhere to the most stringent of these.

The purpose of this guidance is to promote the safe use of and to reduce the likelihood of injuries involving hand or power tools.

12.2 Guidance

1. The Contractor and the worker must ensure the correct tool for the job being performed has been chosen and ensure that the tool is in good condition and used properly.
2. All hand and power tools and similar equipment whether furnished by the Contractor or the employee shall be maintained in a safe condition.
3. The Contractor shall not permit the use of unsafe tools. They shall be removed from service.
4. When tools are designed to accommodate guards, they shall be equipped with such guards. Guards shall never be removed or rendered inoperable.
5. Reciprocating, rotating, or moving parts of equipment or tools that present either in-line nip point or pinch point hazards, shall be guarded to prevent employee from contacting.
6. Equipment that can be electrically driven is preferred.
7. All fuel-operated (diesel, gasoline) generators shall not be located inside any building.
8. Fuel powered equipment shall not be staged where the exhaust can be captured by air handling equipment or enter back into a building by other means.
9. The use of Liquid Propane (LP) below grade is prohibited. Authorization to use LP Gas below grade shall be required by the governing fire department in writing.
10. LP equipment is Carbon Monoxide (CO) producing. When CO producing equipment is utilized "indoors" the Contractor shall have a plan in place to monitor and mitigate the hazard to the workers.
11. Chisels, screwdrivers, and pointed tools shall never be carried in an employee's pocket. They are to be carried in a toolbox/cart, a carrying belt (sharp/pointed end down), a pocket tool pouch, or in the hand with points and cutting edges pointed away from the body. Employees carrying tools on their shoulders should pay close attention to clearances when turning



around. Tools should also be handled so that they will not strike other employees or bystanders.

12.3 Personal Protective Equipment (PPE)

1. Appropriate PPE (e.g., safety glasses, face shield, safety goggles, gloves, etc.) should be worn to protect from hazards that may be encountered while using portable power tools and hand tools. PPE must protect a person using hand tools who is exposed to hazards, such as falling, flying, abrasive and splashing objects, or harmful dust, fumes, mists, vapors, or gases.
2. Employees who use hand and power tools and are exposed to the hazards of falling, flying, abrasive, and splashing materials, or who are exposed to harmful dusts, fumes, vapors, or gases shall be provided with the specified personal protective equipment necessary to protect them from the hazard.

12.4 Hand Tools

Hand tools are non-powered, and include axes, wrenches, screwdrivers, hammers, etc.

1. Impact tools shall be kept free of mushroomed heads.
2. Wooden handles of tools shall be crack- and splinter-free and shall not be covered by tape.
3. Tools shall be affixed tightly to handles.

12.5 Power Operated Hand Tools

Use power tools only after becoming thoroughly familiar with their controls, safety requirements, and operating procedures.

1. All hand-held power tools shall be equipped with the appropriate positive “on-off”, momentary contact or constant pressure switch in good working order.
2. Electric power-operated tools shall be double insulated or grounded.
3. Electrical cords on tools shall not be used to hoist or lower such equipment.
4. Never carry a tool by the cord or hose.
5. Never yank the cord or the hose to disconnect it from the receptacle.
6. Keep cords and hoses away from heat, oil, and sharp edges.
7. Cords must be free of frays/cuts. If the cord is damaged, the equipment shall be removed from service immediately.
8. Disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits, and cutters.
9. Avoid accidental starting. Do not hold a finger on the switch button while carrying a plugged-in tool.



10. Tools should be maintained with care and kept sharp and clean. Follow instructions in the user's manual for lubricating and changing accessories. All portable electric tools that are damaged shall be removed from use and tagged "Do Not Use".

12.6 Guards

Workers need to safeguard the hazardous moving parts of a power tool. Workers must guard belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, and other reciprocating, rotating, or moving parts of equipment if such parts are exposed to contact by employees.

1. Guards should be provided to protect the operator and others from the following:
 - a. Point of operation
 - b. In-running nip points
 - c. Rotating parts
 - d. Flying chips and sparks.
2. Safety Guards shall never be removed when a tool is being used. Workers must equip portable circular saws with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except when it contacts the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work.
3. Other hand-held powered tools such as circular saws having a blade diameter greater than 2 inches, chainsaws, and percussion tools without positive accessory holding means must be equipped with a constant pressure switch that will shut off the power when the pressure is released.

12.7 Fuel-Powered Tools

1. Weed eaters, lawn mowers, cut-off saws and chainsaws are examples of fuel-powered tools. Guidelines for the safe use of these tools include:
2. All fuel-powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored in approved safety cans.
3. Leakage or spillage of flammable or combustible liquids shall be disposed of promptly and safely.
4. Operate the machines only in well-ventilated areas. When fuel-powered tools are used in enclosed spaces, the applicable requirement for concentrations of toxic gases and use of personal protective equipment shall apply.
5. Use caution when handling fuel by moving the fuel at least 10 feet from the cutting machine before starting the engine.



6. Keep the handles dry, clean, and free of oil or fuel.
7. Make sure all guards are on and in good working order.

12.8 Pneumatic Power Tools

Pneumatic tools include chippers, drills, nail/staple/screw guns, hammers, and sanders.

1. Pneumatic power tools and hose sections shall be secured by threaded couplings or quick disconnect couplings or by 100 lb. tensile strength safety chain or equivalent across each connection to prevent the tool or hose connection from becoming accidentally disconnected.
2. Chicago couplings shall be pinned at the coupling(s).
3. Whip checks shall be used at all hose-to-hose, hose-to-tool and compressor-to-hose connections.
4. Pneumatic hand tools shall be disconnected from the power source and pressure bled from hose prior to any adjustments or repairs to the tools.
5. Air hoses located on roadways shall be protected to prevent vehicular damage.
6. Compressed air shall not be used at the nozzle for cleaning purposes except where reduced to less than 30psi.

12.9 Hydraulic Power Tools

1. The fluid used in hydraulic tools shall be fire-resistant and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.
2. The manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

12.10 Powder-Actuated Tools

1. Only employees who have been trained in the operation of the tool in use shall be allowed to operate a powder-actuated tool.
2. Qualified operators shall have their operator's card in their possession while operating such equipment.
3. A lockable container shall be provided for each tool.
4. Signage shall be posted and maintained in plain sight where tools are used.
5. Loaded tools shall not be left unattended.
6. Proper hearing, eye, and face protection shall be utilized.
7. Tools shall be inspected prior to use.
8. Tools shall be used only on the recommended surfaces with the recommended loads per manufacturer's instructions.
9. Unused or misfired loads must be properly disposed of.



10. The tool shall be tested each day before loading to see that safety devices are in proper working condition. The method of testing shall be in accordance with the manufacturer's recommended procedure.

12.11 Miscellaneous Construction Tools and Equipment

12.11.1 Portable Compressors

1. When portable compressors on wheels stand unattached to other equipment, they shall be positively locked, blocked, or otherwise adequately prevented from rolling.
2. Fans shall be guarded with a shroud or side screens.
3. Compressed air tanks shall be drained of liquid as recommended by the manufacturer's specifications.
4. Compressor safety valves shall be popped at least weekly.

12.11.2 Concrete and Masonry Equipment

12.11.2.1 Concrete Mixers

1. Concrete mixers equipped with 1-yard, or larger, loading skips shall be provided with a device to clear the skip of material. Skip clearing shall not be done by a worker standing under or near a raised skip while striking it with a hand-held implement.
2. On concrete mixers of 1 yard capacity, or larger, guardrails of pipe or similar material shall be provided on each side of the dangerous area under the raised skip.
3. Bull float handles, which could come in contact with energized electrical conductors, shall be constructed of nonconductive material.
4. Concrete troweling machines--of the powered, rotating-blade type--that are guided manually shall be equipped with a control or switch that will automatically shut off the power whenever the operator's hands are removed from the equipment handles.

12.11.2.2 Mortar, Plaster, or Fireproofing Mixers

1. Grid guards on mortar, plaster, or fireproofing mixers of 1 yard capacity or smaller shall have a grid opening not to exceed 16 square inches with a minimum clearance of 5 inches from the top of the grid guard to the top of the mixing paddles.
2. All mortar, plaster, or fireproofing mixers of 1 yard capacity or smaller shall be equipped with grid guards with an opening not to exceed 16 square inches with a minimum clearance of 5 inches from the top of the grid guard to the top of the mixing paddles.



13.0 FIRE PROTECTION

13.1 Scope and Purpose

The major objective of fire safety is to prevent fires before they start. Fire safety is based upon the principle of keeping fuel sources and ignition sources separate.

This section provides guidance to all employees who may use a fire extinguisher in the workplace to fight an incipient fire.

13.2 Fire Extinguishers

The ABC dry-chemical fire extinguisher is the most commonly used extinguisher on construction job sites.

Contractor must:

1. Maintain in good operating condition and periodically inspect firefighting equipment.
2. Immediately replace defective equipment.
3. Conduct an annual maintenance check of the fire extinguisher and record the maintenance date.
4. Retain this date for one year after the last entry or the life of the shell, whichever is less.
5. Know how to operate fire extinguishers and the hazards involved.
6. Know the classifications of fire extinguishers and classes of fires.
7. Know how to make sure that a used fire extinguisher has been recharged before it is returned to its holder.
8. Know who to notify that the extinguisher has been used and needs recharging.
9. Know the location and proper usage of all fire extinguishers. Firefighting equipment must be kept in top condition. Report any deficiencies immediately.

13.3 Guidance

1. Fuel sources are the easiest element to remove. Therefore, concentrate on cleanup by disposing of scrap before it accumulates, storing flammable liquids in approved self-closing containers, and keeping all flammable and combustible material away from all heating devices or heat sources.
2. Shut engines off to allow hot parts to cool before refueling.
3. In the event of a fire, means should be available for calling the fire department quickly. Post signs instructing personnel how and where to turn on an alarm, whether it is by telephone, siren, or horn. Ensure firefighters have easy access to all parts of the project.



4. Follow instructions and perform your job as it should be done. Know and follow all safety procedures. Do not cut corners. Stay clear of prohibited areas.
5. Inspect your equipment and machinery thoroughly on a regular basis.
6. Use flammable products with utmost care.
7. Use approved storage containers only and have them properly grounded.
8. Transport carefully and avoid spills or drips.
9. Follow all accepted disposal procedures.
10. Never make a hole in the walls or floors of any company building without the consent of the Facilities Manager.
11. Correct or report all unsafe conditions (e.g., dirty machinery, ungrounded plugs, frayed wires, overloaded circuits, unprotected flammables, messy rubbish areas, poor ventilation, improper storage, etc.).
12. Maintain good housekeeping habits:
13. Keep aisles and passageways clear.
14. Safely contain trash.
15. Keep storage areas clean.
16. Ensure that all electrical equipment is properly maintained and grounded.
17. Keep tools and equipment clean.
18. Observe all "No Smoking" signs. Smoking is strictly forbidden in all facilities.
19. Grease and rubbish shall not be allowed to accumulate in elevator shafts and pits.
20. When temporary, combustion-type heating devices, such as Salamanders or liquid propane heaters are used:
21. Adequate fresh air shall be available, or mechanical ventilation shall be provided.
22. They shall not be set directly upon wood floors or other combustible materials unless the heater is specifically designed for that purpose.
23. They shall be located at least ten feet from the vicinity of combustible materials such as tarpaulins, canvas, plastic film coverings, and portable fuel tanks.
24. They shall be horizontally level, unless otherwise permitted by the manufacturer's markings. Portable fuel tanks shall be securely placed to prevent overturning and the spillage of fuel.
25. Defective or inadequate electric wiring shall be immediately repaired, removed, or replaced. Oversized fuses or oversized circuit breakers shall



not be used. Fuse and circuit breaker boxes shall be kept closed except during maintenance or testing.

26. Employees shall not use matches or open flames and shall prevent electric sparks in areas where combustible gases may exist until tests prove that combustible gases are not present. Such conditions may exist in confined spaces such as gas-filled electrical equipment, or in manholes, vaults, battery rooms, or transformer or oil circuit breaker tanks.
27. Flammable liquids, such as gasoline, benzene, naphtha, and lacquer thinner shall be kept in approved safety cans identified by proper markings. The quantity shall be kept to a minimum except in approved areas. Flammable liquids shall be kept in closed containers when not in use. Where more than five gallons of flammable or combustible liquids or five pounds of flammable gas are being used, a fire extinguisher with a U.L. rating of not less than 10B shall be provided within 50 feet.
28. Flammable liquids such as gasoline, benzene, naphtha, and lacquer thinner shall not be used for cleaning purposes. Safety solvents are appropriate for this use.
29. When pouring or pumping flammable liquids from one container to another, metallic contact shall be maintained, or an electrical bonding jumper connected between the containers to minimize the possibility of static spark ignition shall be employed.
30. Paint spray booths shall be properly ventilated, and adequate firefighting equipment shall be provided. "No Smoking" signs shall be conspicuously posted.
31. Proper precautions (to include no ignition sources, proper housekeeping, correct storage, and sand or chemical appropriate for dust fire extinguishment) shall be used in the presence of material in the form of dust or powder to prevent an explosion.
32. Firefighting equipment shall not be used, tampered with, or removed from designated locations for purposes other than firefighting or rescue operations.
33. Fire doors shall be properly identified and maintained in good operating condition and checked periodically. Materials or equipment shall not be placed to obstruct the fire doors.
34. Flame or excessive heat shall not be used near fire-detecting devices or automatic sprinkler heads in service. A clearance of at least 18 inches shall be maintained between the top level of equipment or stored material and sprinkler heads or fire detectors.

13.4 Training

Training is required where the contractor has provided or allows portable fire extinguishers for employee use. Training shall occur at initial time of hire and annually



thereafter. It is the responsibility of the employee's supervisor to ensure that training has occurred.

Quick References

29 CFR 1910.157 Portable Fire Extinguishers

29 CFR Subpart F Fire Protection and Prevention

NFPA 10 Standard for Portable Fire Extinguishers



14.0 HEARING CONSERVATION

14.1 Scope and Purpose

Contractors are required to use feasible engineering and administrative controls as the primary means of reducing excessive sound levels. Where those controls are not feasible, employers should provide their employees with ear protective devices and ensure employees wear the protective devices.

14.2 Guidance

Contractors shall actively participate in a Hearing Conservation Program by:

1. Identifying high noise areas and equipment and possible noise control methods
2. Ensure personnel are properly wearing hearing protection in designated high noise areas or when operating high noise equipment/tools
3. Ensure employees keep appointments for hearing tests, follow-up testing or medical referral.

The Contractor's primary responsibilities are:

1. Perform noise monitoring (initially and when conditions change) and provide this information to hearing test provider.
2. Train affected personnel regarding the Hearing Conservation Program.
3. Provide personnel the opportunity to observe noise monitoring and provide noise measurement information to them.
4. Document high noise level areas and equipment at each site.
5. Implement feasible noise controls with appropriate outside assistance.
6. Install appropriate warning signs for high noise areas and equipment.
7. Maintain an "approved list" of hearing protection suitable for use.
8. Ensure that personnel receive hearing tests and any appropriate follow-up designated by the Hearing Conservation Program.

14.3 Recordkeeping

All records of noise exposure monitoring shall be retained by the Contractor for a minimum of 2 years. All audiometric test records shall be retained for the duration of the affected personnel's employment. Audiometric test records will contain the following information:

1. Audiograms with name, job classification, date, examiner's name, date of the last acoustic or exhaustive calibration of the audiometer.
2. Audiometric test room measurements. Ensure that personnel that have experienced a Standard Threshold Shift (STS) on a hearing test are re-tested within 30 days of notification.



14.4 Training

Training is required at time of assignment and annually for all employees who are exposed to occupational noise at or above an 8-hour time weighted average of 85 decibels.

Quick Reference

[29 CFR 1910.95 Occupational Noise Exposure](#)

[29 CFR 1926.52 Occupational Noise Exposure](#)

[29 CFR 1926.101 Hearing Protection](#)



15.0 CONFINED SPACES

15.1 Scope and Purpose

This section describes the procedures and responsibilities for employees to safely enter confined spaces and be able to distinguish between permit-required and non-permit-required confined spaces.

29 CFR 1910.146 Confined-Space Standard for General Industry contains requirements mentioned in this section. A separate confined-space rule has not yet been issued for construction, but the regulations in the respirator standard (**29 CFR 1910.134**) regarding entry into IDLH atmospheres apply to construction.

15.2 Guidance

1. The Contractor will identify and evaluate all confined spaces and whether entry requires a permit. It is the Contractor's responsibility to take all precautionary measures necessary for safe confined-space entry and to instruct employees in hazards involved, precautions to take, the proper use of PPE, and any emergency equipment required.
2. The Entry Supervisor in Charge will have the responsibility of initiating the confined-space entry permit before allowing anyone into the confined space.
3. Permit-required confined space means a confined space that has one or more of the following characteristics:
 - a. Contains or has the potential to contain a hazardous atmosphere
 - b. Contains a material that has the potential for engulfing an entrant
 - c. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section
 - d. Contains any other recognized serious safety or health hazard.
 - e. A hazardous atmosphere is an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to escape unaided from a space, injury or acute illness from one or more of the following causes:
 - f. Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit
 - g. Airborne combustible dust at a concentration that meets or exceeds its lower flammable limit
 - h. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent
 - i. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in **29 CFR 1910 Subpart Z**,



Toxic and Hazardous Substances and could result in employee exposure in excess of its dose

- j. Any other atmospheric condition that is immediately dangerous to life and health.
4. Examples of confined spaces may include but are not limited to excavations, sewers, pipelines, storage tanks, underground utility vaults, pits, ventilation and exhaust ducts, tunnels, boilers, bins, vessels.

15.3 Hazards

1. Examples of commonly encountered hazards in confined spaces:
 - a. Toxic air contaminants
 - b. Flammable gas
 - c. Insufficient oxygen
 - d. Electric shock from portable lights, tools or assorted electrical equipment
 - e. Physical hazards, such as slipping, falling, and falling objects
 - f. Physical deficiencies causing collapse because of fatigue, low resistance to temperature extremes and general poor health
 - g. Mechanical equipment inadvertently activated, such as agitators and mixers
 - h. Inadvertent starting of pump and/or opening of valves leading in or out of tanks or vessels.

15.4 Permit-Required Confined Space Entry Practices

15.4.1 Pre-Entry

1. Specify acceptable entry conditions.
2. Identify and evaluate the hazards of permit spaces before employees enter.
3. Isolate the permit space.
4. Purge, inert, flush, or ventilate as needed.
5. Implement the measures necessary to prevent unauthorized entry.
6. Provide entry permit identifying the space to be entered, purpose of entry, date(s), authorized entrants, and other pertinent information.
7. Provide barriers to protect entrants from external hazards.
8. Provide trained attendants capable of rescuing or summoning rescuers outside the space.
9. Provide the following equipment at no cost to employees, maintain that equipment properly, and ensure that employees use it properly:



- a. Testing and monitoring equipment,
 - b. Ventilating equipment,
 - c. Communications equipment,
 - d. PPE,
 - e. Lighting equipment,
 - f. Barriers and shields,
 - g. Equipment for safe entrance and exit,
 - h. Rescue and emergency equipment,
 - i. Any other equipment necessary for safe entry into and rescue from permit spaces.
10. Periodic or continuous testing must be done the entire time the confined space is occupied. When testing for atmospheric hazards, test first for oxygen, then combustible gases and vapors, and then for toxic air contaminants.

15.4.2 Entry

1. The procedures outlined are intended as a minimum precaution. Carefully consider each entry, whether permit required or not, to determine how the hazardous atmosphere developed. Contractor must implement measures to protect employees from a hazardous atmosphere before any subsequent entry takes place.
2. Complete and post a confined-space entry permit at the entry point.
3. Station one or more attendants at the access opening at all times when employees are working inside.
4. The attendant(s) must be in constant communication with the entrant(s). No one will enter a confined space under any condition without an outside attendant who is trained and capable of rescuing the entrant. The attendant(s) must never enter the confined space without SCBA or equivalent protection. **29 CFR 1910.146** requires retrieval systems or methods, such as a safety harness with lifeline, except where it creates a hazard.
5. Employee rescue service personnel must make practice rescues at least once every 12 months.
6. Use only non-spark-producing tools in a potentially explosive atmosphere.
7. To reduce the risk of electrical shock, consider using low-voltage (12 volts or less) electrical lighting and equipment, or portable battery lights.
8. Use only approved, grounded electrical equipment.
9. Consider using air-operated tools where possible.



10. Do not take cylinders of oxygen and other gases, except SCBAs, into tanks or vessels.
11. Use the following personal protective clothing and equipment for employee protection when applicable:
 - a. Safety harness with lifeline (except where it creates a hazard itself)
 - b. Air-line respirator (with escape bottle in IDLH atmospheres) or SCBA equipment
 - c. Protective suit
 - d. Safety glasses, hard hat, rubber gloves or other equipment appropriate for the environment.
12. Continuous forced-air ventilation is required when alternative entry is permitted under [29 CFR 1910.146 \(c\)\(5\)](#). Test the atmosphere within the space at various levels to ensure that the continuous forced-air ventilation is preventing the accumulation of a hazardous atmosphere.
13. When circumstances change, a non-permit required confined space might become permit required and vice versa.
14. If employees detect a hazardous atmosphere during entry, each employee will leave the space immediately. The space will be evaluated before any re-entry.

15.5 Training

The employer will provide adequate training in pre-entry practices and entry practices to all affected employees.

Training is required at time of assignment, before a change in duties, whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained, or whenever the employer has reason to believe either that there are deviations from the permit space entry procedures require or that the employee knowledge of the procedures is inadequate.

Quick Reference

[29 CFR 1910.146 Permit-Required Confined Spaces](#)

[29 CFR 1926 Subpart AA Confined Spaces in Construction](#)



16.0 WELDING, CUTTING, AND BRAZING

16.1 Scope and Purpose

Safe procedures for welding and cutting are extensive because of the many hazards involved. Health hazards from welding, cutting, and brazing operations include exposures to metal fumes and to ultraviolet radiation. Safety hazards from these operations include burns, eye damage, electrical shock, cuts, and crushed toes and fingers. Locations such as confined spaces, under docks, and at heights contribute to the hazards. Many of these can be controlled with proper work practices and PPE.

16.2 Guidance

Welding, cutting, and brazing is addressed in specific OSHA standards for general industry, construction, and maritime. [29 CFR 1910 Subpart Q](#), [1926 Subpart J](#), and [1915 Subpart D](#) are specific to Welding, Cutting, and Brazing, however, other regulations are applicable to this work such as [1910 Subpart Z, Toxic and Hazardous Substances](#) and [NFPA 51B-1962, Standard for Fire Prevention in Use of Cutting and Welding Processes](#).

1. The Contractor shall ensure their employees and sub-contractors comply with all the applicable regulations.
2. Contractors shall recognize their responsibility for the safe usage of cutting and welding equipment, and based on fire potentials, establish areas and procedures for cutting and welding.
3. Cutting or welding shall be permitted only in areas that are or have been made fire safe. When work cannot be moved practically, as in most construction work, the area shall be made safe by removing combustibles or protecting combustibles from ignition sources.
4. If cutting and welding operations are performed in areas not designed for such, an individual will be designated as the responsible authority to approve locations not designed for cutting and welding.

16.3 Compressed Gases - General

Compressed gas and equipment are addressed in specific OSHA standards for general industry, construction and maritime. [29 CFR 1910 Subparts H, M, and Q](#), [29 CFR 1926 Subparts D and J](#), [29 CFR 1915 Subparts D and G](#), and other regulations apply to the hazards of use and storage of compressed gases.

1. If moving cylinders a short distance, you can tip them and roll them on the bottom edge. Do not drag the cylinders along the floor. Cylinders are best moved with a suitable hand truck.
2. Always store and use cylinders in the upright position and secure them against falling.
3. If the cylinders are not labeled, do not use the contents.
4. Caps should always be in place except when the cylinders are in use.



5. Separate stored oxygen cylinders from fuel-gas cylinders or combustible materials by a minimum distance of 20 feet or by a non-combustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.
6. Do not store cylinders with the pressure reducing/regulator device.
7. Always use a pressure-reducing device when withdrawing gas from gas cylinders used for welding and cutting operations. Inspect connection nuts and fittings before each use to detect faulty seats.
8. Before connecting a regulator to a cylinder valve, wipe the valve outlet with a clean cloth free of oil or lint. Then crack the valve by opening the valve momentarily and closing immediately. This clears the valve of dust or dirt that might otherwise enter the regulator.
9. Mark *USE NO OIL* on gauges used for oxygen service and drain oxygen before attaching to the cylinder. Always open oxygen cylinder valves slowly.
10. Do not use acetylene at a pressure more than 15 psig. At about 25 psig acetylene becomes unstable and doesn't need a spark or flame to explode.
11. Distinguish fuel gas and oxygen hoses from each other. The generally recognized colors are red for fuel gas hose, green for oxygen hose and black for inert gas and air hose. Do not interchange the oxygen and fuel gas hoses.
12. You can tape together parallel lengths of oxygen and fuel gas hose for convenience and to prevent tangling, but not more than 4 inches in each 12 inches shall be covered with tape.
13. Repair or replace hoses showing leaks, burns, worn places, or other defects.
14. Clean torch tip openings that become clogged with suitable cleaning wires, drills or other devices designed for such purpose.
15. Inspect torches prior to their use for leaking shutoff valves, hose couplings, and tip connections.
16. Use friction lighters or other approved devices to light torches, and not matches or hot work.

16.4 Training

Workers who cut, weld, and braze must be trained thoroughly to ensure the safe use of equipment and processes, along with procedures used to control hazardous conditions.

Quick Reference

[29 CFR 1926 Subpart J Welding and Cutting](#)

[NIOSH Publication 88-110 Welding, Brazing and Thermal Cutting](#)

[ANSI/AWC Z49.1 Safety in Welding and Cutting](#)

[ANS F3. 2M/F3.2 Ventilation Guide for Weld Fume](#)



17.0 WORKING IN OUTDOOR AND INDOOR HEAT ENVIRONMENTS

17.1 Scope and Purpose

Heat stress can cause illnesses as well as decrease productivity and increase the likelihood of injuries. These guidelines are applicable to outdoor work such as construction, landscaping, and outdoor field work, and also to employees working in vehicles that do not have air-conditioning.

The purpose of this section is to provide guidance on controlling the hazards posed by exposure to heat when working outdoors and protect employees from the risk of heat-induced illnesses that may result from exposure to excessive heat outdoors. Adequate controls, methods, and procedures will be used to reduce the risk of heat related illness when heat exposure could be a problem.

Heat illness is a recognized hazard under the OSHA general duty clause and Contractors will implement preventions to heat exposure.

This program will be applied based on predicted temperatures and clothing requirement: **EMBARC will use 87°F instead of 89°F since weather prediction in this region is imprecise.**

17.2 Guidelines

1. Contractors have the primary responsibility for the implementation of the guidance in this section in their work area.
2. The Contractor has ultimate responsibility for the safety of the employees. This includes evaluation of the work to be performed, providing ready access to drinking water, allowing for acclimatization of workers in hot environments, adopting work rest regimes, scheduling work to reduce heat stresses as appropriate, and ensuring workers attend required annual training to familiarize them with the signs and symptoms of heat related illnesses and disorders.
3. Between May 1 and September 30, the Contractor will check weather forecasts to determine if daily high temperatures are predicted to be within 2°F of the Outdoor Temperature Action Level of 87°F. The Contractor will notify their management and employees when the temperatures are predicted to be within 2°F of 87°F. Managers/crew leads will respond by ensuring adequate water and other controls are available to employees.
4. There is no requirement to maintain temperature records. The National Weather Service can be used to determine predicted temperatures in the Oklahoma City region.
5. Contractors must also ensure that the program is understood and followed by their employees.
6. Duties of the Contractor include:
 - a. Require that all personnel under their direction be familiar with and adhere to the procedures for working safely in hot weather.



- b. Ensure that employees are supplied enough water and breaks.
- c. Perform site inspections to evaluate compliance.
- d. Workers have the responsibility for working in accordance with the provisions of this section, including drinking enough water to prevent dehydration.

17.3 Hazard Assessments of Outdoor Work

Four environmental factors affect the amount of stress a worker experiences in a hot environment: temperature, humidity, air velocity, and radiant heat. Examples of radiant heat include direct heat from the sun or an equipment engine. Job-related factors that affect heat stress include work rate and physical effort required, type of clothing and PPE used, and duration of activity. All of these factors need to be evaluated to minimize impact on the worker. Personal characteristics such as age, weight, physical fitness, and acclimatization to the heat also need to be considered to determine those people and areas at high risk.

Assessments shall include the job classifications that work out of doors, related activities and level of activity, engineering/administrative controls, and PPE used when performing these activities. Assessments will be conducted in concert with the EMBARK Safety Department.

The [OSHA-NIOSH Heat Safety Tool App](#) is a useful resource for planning outdoor work activities based on how hot it feels throughout the day. Featuring real-time heat index and hourly forecasts, specific to your location, as well as occupational safety and health recommendations from OSHA and NIOSH.

17.4 Control of Heat Stress

The following measures should be implemented in combination; no single measure will usually be sufficient to adequately protect outdoor workers from seasonal heat and ultraviolet radiation.

1. Exposures may be more easily reduced using administrative controls such as limiting the time spent in the hot areas.
2. To reduce the risk of heat stress during periods of seasonal heat, moderate and heavy outdoor work should be assigned to the cooler parts of the day whenever feasible. Work involving the use of machinery should also be assigned to the cooler parts of the day whenever feasible as hot conditions can reduce concentration.
3. Provide more frequent rest breaks and/or longer breaks in cool areas.
4. Consider worker rotation or assigning more workers to perform the same tasks can reduce the exposure time and decrease the physical workload.
5. Outdoor work tasks should be shaded as much as possible. Use should be made of natural shade from trees, buildings and other structures. Shade can also be created using canopies, tents and other portable, easily erected shade structures.



6. Alternative tasks should be available when heavy or moderate manual work is not advisable.
7. Rest Breaks - The recommended rest break period per hour for average workers performing moderate manual work in hot weather is 10 minutes. For fit, experienced workers who are keeping up their fluid intake, 5 minutes rest in every hour when doing moderate work is often adequate. However, if for any reason fitness is reduced (e.g., if they have a viral infection), workers should go back to 10 minutes rest per hour until they feel comfortable taking less. New or inexperienced workers should be permitted to take at least a 10-minute rest break per hour when doing moderate work in hot weather until such time as they subjectively feel comfortable taking a shorter break.
8. Length of time needed for rest breaks also depends on two other factors that affect the speed at which a worker can cool down after working in the heat:
 - If rest breaks can be taken in a cooled or air-conditioned building, shorter rest breaks may be adequate.
 - When workers use sunscreens, the speed at which they can cool down is reduced due to decreased evaporation of sweat and longer rest breaks may be needed. Short work periods followed by short rest breaks are better than long work periods followed by long rest breaks.

17.5 Personal Protective Equipment

17.5.1 Clothing

Recommended clothing for protection of the skin from ultraviolet light is loose fitting and allows sweat to evaporate. Closely woven breathable fabrics of light colors are recommended. Cotton is the best fabric. Long-sleeve shirts and long trousers give good skin protection. The remaining exposed parts of the body should be protected by other means. Where fire retardant clothing is required, the properties of that clothing should be reviewed.

17.5.2 Hats

The recommended hat has an all-round brim and is made of natural fibers in a light color. Where hard hats are required, they should be of the wide brim type and sweatbands should be available for insertion.

17.5.3 Sunscreens

The provision of sunscreens is not a requirement though is recommended. The recommended sunscreen cream is a broad spectrum, waterproof type with a high sun protection factor. Some individuals may be sensitive or photosensitive to sunscreen ingredients, so one may not be suited to all and alternatives should be provided where necessary.



For maximum effectiveness, sunscreens should be applied to clean dry skin 15 minutes before going out into the sun. They should be wiped on rather than rubbed into the skin, and they should be reapplied at least every 2 hours. When profuse sweating occurs, sunscreen creams may need to be reapplied more often. Lip protection is also important so a SPF 15+ sunscreen should be regularly applied to the lips.

17.5.4 Sunglasses

The recommended sunglasses protect against ultraviolet light penetration at the front and sides of the face and give impact protection. There are safety glasses with ultraviolet protection and tinting to reduce glare. These safety glasses are also available without tinting for indoor use. Ordinary sunglasses may also be used where impact or dust protection is not required. The provision of ordinary sunglasses is not required.

17.6 Health Disorders

The following procedures will be implemented when employees are observed exhibiting signs or symptoms of heat illness or complain of such:

1. Ensuring that effective communication by voice, observation, or electronic means is maintained so that employees at the work site can contact a supervisor or emergency medical services when necessary.
2. If a supervisor observes, or any employee reports, any signs or symptoms of heat illness in any employee, the supervisor shall take immediate action commensurate with the severity of the illness.
3. Immediately report to appropriate supervisory personnel the employee's condition, work location, and work activities.
4. An employee exhibiting signs or symptoms of heat illness shall be monitored and shall not be left alone or sent home without being offered onsite first aid and/or being provided with emergency medical services in accordance with the employer's procedures.

17.7 Training

Supervisory personnel and employees who normally work outdoors in seasonal environments will receive, at a minimum, annual training. Initial training will occur before temperatures exceed the Outdoor Temperature Action Levels and annually thereafter.

Training will include:

1. Environmental factors that contribute to the risk of heat-related illness
2. Methods used to avoid heat-related illnesses
3. The importance of acclimatization
4. The principles of heat stress prevention including the importance of removing heat-retaining clothing and PPE during all breaks



5. The value of frequently consuming small quantities of drinking water or other acceptable beverages
6. Recognition of heat stress
7. Identification of the common signs and symptoms of different types of heat related illness
8. First aid response to heat stress/ heat related illness
9. Importance of immediately reporting signs or symptoms of heat related illness to the person in charge and procedures to follow for emergency response.
10. Supervisors shall have additional training on procedures they must follow to implement this program. Training shall include: How to monitor an employee at risk for heat stress disorders.
11. What to do if an employee exhibits signs or symptoms consistent with possible heat-related illness, including appropriate emergency response procedures.
12. Procedures for moving or transporting an employee(s) to a place where the employee(s) can be reached by an emergency medical service provider.

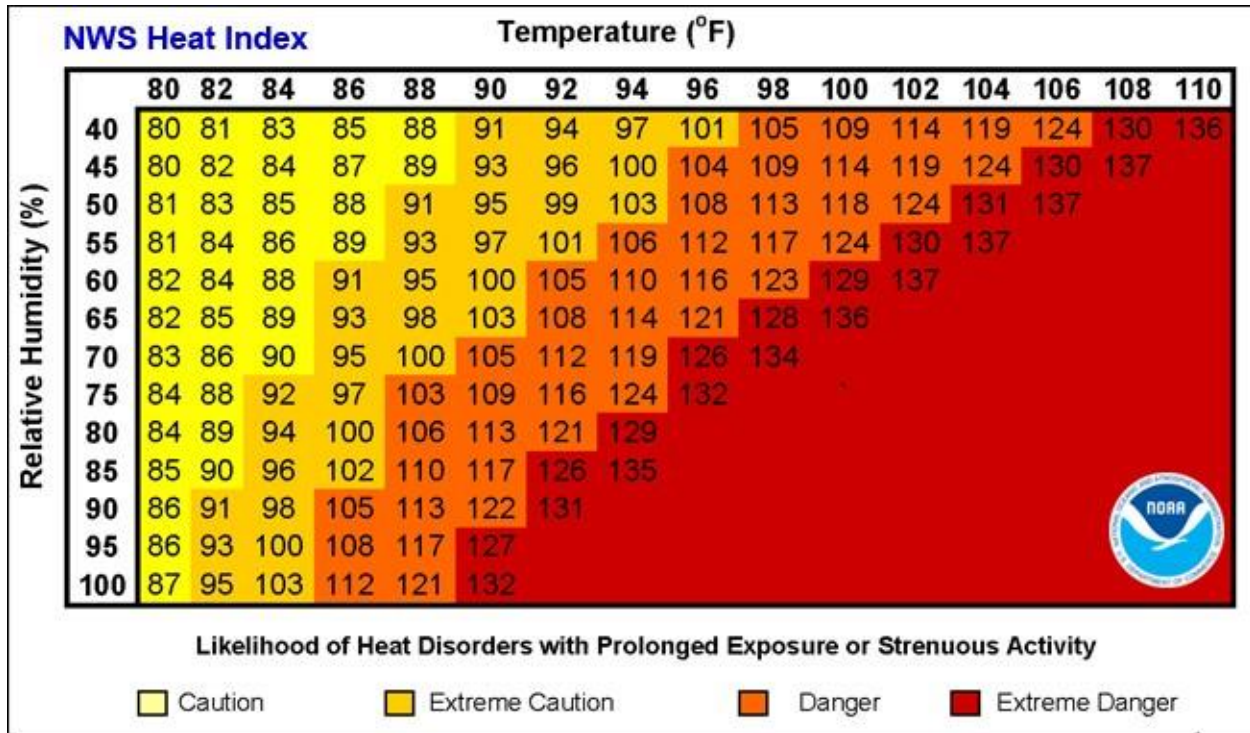


17.8 Heat Disorders

Disorder	Cause	Signs & Symptoms	Treatment	Prevention
Transient Heat Fatigue	Discomfort. Stress from the heat less than what would result in other heat illnesses	Decline in performance, particularly in skilled physical work, mental tasks, and those requiring concentration.	No treatment necessary unless other signs of heat illness are present.	Acclimatization and training.
Heat Rash	Skin is constantly wet from sweat. Sweat gland ducts become plugged, leading to inflammation.	"Prickly heat", tiny, raised, blister-like rash.	Keep skin clean and dry.	Shower after working in hot environment. Keep skin dry.
Heat Cramps	Not well understood. May be due to a loss of salt from sweating. Dehydration is a factor.	Painful muscle spasms in the arms, legs, or abdomen during or after hard physical work. Sudden onset Hot moist skin.	Rest. Drink water and eat more salty foods. Massage cramped area.	Adequate water intake and adequate salt intake at meals. Do not use salt tablets.
Heat Exhaustion	Dehydration causes blood volume to decrease.	Fatigue, weakness, dizziness, faintness. Nausea, headache. Moist, clammy skin, pale or flushed. Rapid pulse. Normal or slightly elevated temperature.	Move victim to shade/cool area. Rest lying down, legs elevated. Drink fluids.	Acclimatization. Drink plenty of water.
Heat Syncope	Dehydration causes blood volume to decrease. Blood pools in dilated blood vessels of the skin and lower body, making less blood available to the brain.	Fainting while standing erect and immobile. A variant of heat exhaustion. Symptoms of heat exhaustion may precede fainting.	Move victim to a cool area. Have victim rest and drink fluids.	Acclimatization. Drink plenty of water. Avoid standing in one place. Intermittent activity to avoid blood pooling.
Heat Stroke	Partial or complete failure of sweating mechanism. The body cannot get rid of excess heat.	Usually hot, dry skin, red, mottled, or bluish. Lack of sweating though sweating may still be present. Difficulty breathing. Chills. Weakness. Confusion, loss of consciousness, convulsions. Rapid pulse. Rectal temperature greater than 104°F. When in doubt, treat as heat stroke. Can be fatal.	Medical emergency. Call paramedics and start cooling victim immediately. Remove victim to a cool area. Soak clothing and skin with cool water and use a fan to create air movement. Shock may occur. Medical treatment is imperative.	Acclimatization. Close monitoring of workers for signs of heat illness. Medical screening. Drink plenty of water.
Note: Alcohol, prescription drugs and other drugs can increase the possibility of heat disorders occurring even if used the previous day.				



17.9 NOAA's National Weather Service Heat Index



Category	Apparent Temperature	Dangers
Extreme Danger	Greater than 120°F	Heat stroke imminent
Danger	105-120°F	Heat exhaustion likely
Extreme Caution	90-105°F	Heat cramps, exhaustion possible
Caution	80-90°F	Exercise more fatiguing than normal

Quick Reference

[Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings, OSHA-2021-0009-0001](#)



18.0 MATERIAL HANDLING AND STORAGE

18.1 Scope and Purpose

This section specifies the minimum requirements for material handling and storage on all EMBARK projects. The purpose of these requirements is to reduce or eliminate the potential of injury to Contractor and EMBARK employees, visitors, and the public.

18.2 Guidance

1. Make sure that all materials stored in tiers are stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse.
2. Conspicuously post the maximum safe load limits of floors within buildings and structures, in pounds per square foot, in all storage areas, except for floor or slab on grade. Do not exceed the maximum safe loads.
3. Keep aisles and passageways clear to provide for the free and safe movement of material handling equipment and employees. Keep these areas in good repair.
4. Do not store materials on scaffolds or runways in excess of supplies needed for immediate operations.
5. Use ramps, blocking, or grading when a difference in road or working levels exists to ensure the safe movement of vehicles between the two levels.
6. Do not place materials stored inside buildings under construction within 6 feet of any hoist way or inside floor openings, or within 10 feet of an exterior wall that does not extend above the top of the material stored.
7. Separate and keep apart non-compatible materials in storage.
8. Stack bagged materials by stepping back the layers and cross keying the bags at least every ten bags high.
9. Do not stack bricks more than 7 feet high. When a loose brick stack reaches a height of 4 feet, taper it back 2 inches for every foot of height above the 4-foot level.
10. Never stack bricks, for storage purposes, on scaffolds or runways.
11. Always stack blocks; do not throw in a loose pile.
12. When stacking masonry blocks higher than 6 feet, taper back the stack one-half block per tier above the 6-foot level.
13. When stacking inside a building, distribute the piles to prevent overloading the floor.
14. Do not drop or throw blocks from an elevation or deliver blocks through chutes.
15. Do not stack lumber more than 20 feet high; if handling lumber manually, do not stack more than 16 feet high.



16. Remove all nails from used lumber before stacking.
17. Stack lumber on level and solidly supported sills, and such that the stack is stable and self-supporting.
18. Stack stored lumber on timber sills to keep it off the ground. Sills must be placed level on solid supports.
19. Place cross strips in the stacks when they are stacked more than 4 feet high.
20. If not racked, stack and block structural steel, poles, pipe, bar stock, and other cylindrical materials as to prevent spreading or tilting.
21. Wear heavy gloves when handling reinforcing steel.
22. When bending reinforcing steel on the job, use a strong bench set up on even dry surface such as a shop floor or outside grounds.
23. Carefully pile structural steel to prevent danger of members rolling off or the pile toppling over.
24. Keep structural steel in low piles, giving consideration to the sequence of use of its members.
25. Stack corrugated and flat iron in flat piles, with the piles not more than 4 feet high; place spacing strips between each bundle.

18.3 Disposal of waste materials:

1. Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, use an enclosed chute of wood or equivalent material.
2. When debris is dropped without the use of chutes, make sure that the area onto which the material is dropped is completely enclosed with barricades at least 42 inches high and 20 feet back from the projected edge of the opening above. Post at each level warning signs of the hazard of falling materials. Do not remove debris in this lower area until debris handling ceases above.
3. Remove all scrap lumber, waste material, and rubbish from the immediate work area as the work progresses.
4. Make sure to comply with local fire regulations if disposing of waste material or debris by burning.
5. Keep all solvent waste, oily rags, and flammable liquids in fire-resistant covered containers until removed from the work site.



19.0 CRANE AND RIGGING SAFETY

19.1 Scope and Purpose

This section not only pertains to cranes and rigging, but also to various other types of hoisting equipment. Because of the wide variety of such equipment in use today, this section will direct its resources to the more common concerns and guidelines and should not be taken as a complete treatise on the subject.

The essence of safe, efficient crane operation is keeping the crane and its load under control at all times. Certain basics apply to every crane operation. Supervisors are responsible for safe operation of all such equipment and for compliance with all applicable federal, state, and local codes.

19.2 Guidance

1. The cranes in use will be operated in accordance with all manufacturer's specifications and limitations.
2. During the initial job-planning stage of the construction operation, the Contractor should decide what its crane requirements will be. Then plan for a crane or cranes adequate to accomplish the job. When selecting a crane, consider a variety of factors other than crane capacity. These may include terrain, ground conditions, weather conditions, crane mobility, and/or overhead utilities.
3. The crane should be in good mechanical condition with sufficient lifting capacity to perform the work required. The crane also should have documented periodic (usually annual) inspections and documented frequent (daily to monthly) inspections. Make sure lifting charts and operator manuals are available onsite.
4. Any attachments utilized with the piece of equipment shall not exceed the capacity, rating, or scope recommended by the manufacturer.
5. A qualified operator is experienced in operating the crane, knowledgeable in methods, means, and limitations of crane use, able to conduct frequent inspections of the crane, and able to read and interpret crane load charts and operator's manuals.
6. The worker giving signals must be familiar with the signals contained in [ANSI B30.5](#). Signals must be clearly visible or audible at all times, and the operator should make no response unless signals are clearly understood. A copy of said signals should be posted in the operating position of each piece of equipment.
7. The operator and signaler will agree in advance to any special signals to be used during the crane operation. Special signals should not conflict with standard signals.
8. To properly plan the lift, the weight of the load, including rigging, headache ball, load line, etc., should be known. The rated load of the crane shall be



plainly marked on each side of the crane and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it, or its load block and this marking shall be clearly legible from the ground or the floor. If the weight is unknown, a knowledgeable person should calculate it. Other factors you may need to consider are center of gravity and attachment points for rigging.

9. Operation of cranes and other boom equipment in the vicinity of power lines is always a situation of potential danger. For that reason, extreme care will always be taken under those circumstances, except in cases where electrical distribution and transmission lines have been deenergized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines. Equipment or machines operating near power lines shall be in accordance with the following:
 - a. For lines rated 50 KV, or below, minimum clearance between the lines and any part of the crane or load shall be ten feet.
 - b. For lines rated over 50 KV, minimum clearance between the lines and any part of the crane must be ten feet, plus one foot for each additional 30 KV.
10. The supervisor will initially be responsible for the provision of equipment which is properly maintained according to manufacturer's recommendations.
11. The equipment shall meet all federal, state, and local regulations with respect to safe operation.
12. The requirement to properly maintain and operate equipment is applicable to those items leased or rented from an outside vendor.
13. All machinery will be inspected on a daily basis (preferably at the beginning of each shift) by the operator and the oiler (as appropriate), and all deficiencies properly documented. Such deficiencies should be corrected on-the-spot prior to operation of the equipment.

19.3 Equipment Requirements

1. Power transmission equipment should be properly guarded.
2. Exhaust pipes should be insulated to prevent employee contact.
3. Cab windows shall be of safety glass or equivalent with no visible distortion.
4. Platforms and walkways shall have anti-skid surfaces.
5. Railings, steps, and handholds shall be provided for easy access to the car and cab as appropriate.
6. Fuel tank filler pipes shall be located so that they will not allow a spill or overflow to run onto the engine, exhaust, or electrical equipment.



7. A swing radius at the rear of the crane should be barricaded in such a manner to prevent employees from being struck or crushed by the crane.
8. Wire rope safety factors shall meet **ANSI B30.5**.
9. The units will be equipped with an approved fire extinguisher.
10. All crawler and truck cranes will meet the requirements for design, inspection, testing, construction, maintenance, and operation as outlined in **ANSI B30.5**.

19.4 Slings and Rigging

When using slings made with wire rope (chokers), alloy steel chain, and synthetic web, in conjunction with other material handling equipment, such as cranes and hoists, follow these tips:

1. Use only slings that are not damaged or defective
2. Never shorten slings with knots, bolts, or other make-shift devices
3. Never load slings in excess of their rated capacities
4. Always pad or protect the slings from the sharp edges of their load
5. Always keep suspended loads clear of all obstructions
6. Always keep employees clear of loads to be lifted and suspended loads
7. Always keep hands and fingers clear of the load while tightening the sling around the load
8. Never pull a sling from under a load that is resting on the sling
9. Inspect rigging equipment for material handling prior to use on each shift and as necessary during its use to ensure that it is safe. Remove defective rigging equipment from service
10. Never load rigging equipment in excess of its recommended safe working load
11. Remove rigging equipment when not in use from the immediate work area so as not to present a hazard to employees
12. Mark special rigging accessories (e.g., spreader bars, grabs, hooks, clamps, etc.) and other lifting accessories with the rated capacity. Proof test all components to 125% of the rated load prior to the first use. Maintain permanent records on the job site for all special rigging accessories.

19.5 Inspections

19.5.1 Wire rope slings

Remove slings from service if any of the following conditions are present:

1. 10 randomly distributed broken wires in one lay or five broken wires in one strand in one lay,



2. Kinking, crushing, bird caging, or any other damage,
3. Evidence of heat damage,
4. Cracked, deformed, or worn end attachments,
5. Stretched or twisted hooks.

19.5.2 Alloy steel chain slings

Remove slings from service if any of the following conditions are present:

1. Defective welds,
2. Bending or elongation of chain links,
3. Cracked or deformed master and coupling links,
4. Removal of the identification tag.

19.5.3 Synthetic web slings

Remove slings from service if any of the following conditions are present:

1. Acid or caustic burns,
2. Melted or charred sling surface,
3. Broken stitches,
4. Snags, tears, or cuts to the point of exposure of the colored threads,
5. Removal of the identification tag.

19.6 Storage

1. Store slings in a dry environment out of the sun, off the floor or ground to prevent damage due to corrosion.
2. Hang slings from hooks to prevent tangling and allow for easy access when needed.
3. A good sling inspection program is not only required, but also cost effective. This prevents sling deterioration and serious accidents caused by sling failure.

19.7 Rigging

1. Improper rigging can lead to accidents involving personal injury or damage to equipment or material. Slings are like any other tool and only trained workers should be allowed to rig loads. The Contractor should designate who is qualified to use slings to rig loads.
2. Rigging consists of the slings, shackles, and spreaders that attach the load to the crane and are designed for the load.
3. Each sling (chain, wire, rope, or synthetic) shall be marked or coded to show rated capacities for each type of hitch and type of material sling is made of.



Fittings shall be of minimum breaking strength equal to that of the sling and shall be free of all sharp edges that could damage material.

4. Accessory components such as hooks, blocks, slings, and pendant control stations shall be kept clean and function labels kept legible. Any accessory that is damaged or showing defects will be removed from service immediately. They will be inspected semi-annually, monthly, and weekly.

19.8 Hoisting Equipment

1. All hoisting equipment, regardless of the intended use, shall be designed, installed, and operated in accordance with the manufacturer's specifications.
2. All such equipment shall be well maintained throughout its utilization at the base.
3. A maintenance history should be available for review should it be requested.
4. There shall be always at least two full wraps of cable on the drums of hoisting equipment.

19.8.1 Lifting

1. Begin the lift by ensuring that the crane is level and on a base with sufficient strength to support the load and pressures generated during the lift.
2. Be sure the swing radius for the boom and counterweight is clear of personnel and equipment.
3. Check for any overhead obstructions, and make sure that the clearance for electrical utilities can be maintained throughout the lift.
4. Perform a trial lift. This lift is one where the load is picked up only a few inches from the ground or the staging surface and held. This lets the operator and rigger observe if the choices of crane configuration, line parts, rigging, and rigging equipment are correct. If the load shifts or something has been overlooked, land the load and stop the operation until adjustments are made.
5. Accomplish the lift in a conservative manner. This means making smooth, steady motions, not too fast, with the load under control at all times. Make no sudden changes of direction or speed. During the lift, never allow the load to swing over personnel. Use taglines to control the load.

Quick Reference

29 CFR 1926.1400 Cranes and Derricks in Construction

ANSI/ASME B30-2010 Cranes and Related Equipment



20.0 LOCKOUT / TAGOUT

20.1 Scope and Purpose

This section establishes the minimum requirements for the lockout/tagout of energy isolating devices as defined by OSHA. It shall be used to ensure that machines or equipment are isolated from all potential energy sources and locked out or tagged out before employees perform services or maintenance activities where the unexpected energization start-up or release of stored energy could cause injury. Persons servicing or maintaining machines and equipment as well as persons affected by those actions shall be trained in these procedures.

This section does not apply to work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or startup of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.

This procedure provides the fundamental components necessary for the deactivation of the mechanical/electrical energy sources through a lockout/block-out/tagout system and to ensure that all authorized and affected personnel have standardized procedures required for locking and tagging out sources of potential energy when servicing or maintaining equipment or systems.

20.2 Guidance

Employees are exposed to a variety of energy sources when performing daily repairs, modifications, and adjustments to their operating equipment. To eliminate the hazards associated with these activities, employers will instruct employees in the correct methods to employ when performing these operations.

1. Before an employee performs any repair, maintenance, or adjustment on any equipment or utility where unexpected energizing, start up, or release of stored energy could occur, the energy source must be isolated/rendered inoperative and then locked and tagged out in that position.
2. Assign employees padlocks with their names or identification numbers affixed to the locks. Individually key the locks to prevent another employee from removing the lock inadvertently.
3. If an energy-isolating device is not capable of being locked out, the authorized servicing person shall utilize the tagout system.
4. Do not attempt to operate any switch, valve, or other energy-isolating device when it has been locked or tagged out.
5. To ensure employees cannot re-energize the equipment while maintenance activities are performed, the employee will lock out/blank out all potential energy sources.



6. Affix a tagout device to all components or systems de-energized to indicate that a lockout procedure has been performed,
7. Prior to performing any work activities, the authorized person will test the systems to ensure he or she properly deactivated the equipment,
8. Upon completion of the work, the authorized person and the supervisor will verify the equipment on the system is safe to operate. Give special consideration to the installation of guards and covers for electrical wiring, and to ensure all piping systems have been properly reconnected. Also notify the affected worker when the machine is OK to use.
9. Whenever major replacement, repair, renovation, relocation, or modification of machines or equipment is performed, and whenever new machines or equipment are installed, energy devices for such machines or equipment shall be designed to accept a lockout device.
10. All Contractors shall ensure that their employees affected by this section are trained. Retraining will be required for authorized and affected employees when there is a change in job assignment, machine/equipment change, a change in energy control procedures, or deviations in the use of energy control procedures or programs.
11. Supervisors shall ensure that employees have the appropriate locks, tags, and specific procedures to perform the work.

20.3 Lockout/Tagout Procedures

1. Notify all affected employees that a lockout/tagout system is going into effect and the reason. The authorized employees shall know the type and magnitude of energy that the equipment or machine uses and understands the hazards presented.
2. If the equipment or machine is operating, shut it down by the normal stopping procedures.
3. Operate the energy isolating device so that the equipment is isolated from its energy source. Stored energy such as in springs, elevated machine members, rotating flywheels, hydraulic systems, air, gas, steam, or water pressure must be dissipated or restrained by repositioning, blocking, bleeding, etc.
4. Lockout/Tagout the energy-isolating device with assigned individual locks/tags.
5. After ensuring that no personnel are exposed, operate the normal operating control to make certain the equipment will not operate. CAUTION — Return operating control to the “off” or “neutral” position after the test.
6. The equipment or machine is now locked out or tagged out and service or maintenance may begin.



20.4 Restoring Equipment or Machines to Normal Operations

1. After servicing or maintenance is complete and the equipment is operationally intact and ready for normal operations, check the area around the equipment to ensure no one is exposed to the hazard of the restart.
2. All affected employees are notified that the lockout device has been removed.
3. After all tools have been removed from the equipment or machine, guards reinstalled, and employees are clear, remove all lockout/tagout devices.
4. Operate the energy-isolating device to restore power to the equipment or machine. Ensure the equipment or machine is operating correctly as specified by the manufacturer.
5. Each lockout or tagout device shall be removed from each energy-isolating device by the employee who applied the device.
6. **Exception:** When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed by the supervisor of the authorized employee if:
 - a. The supervisor verifies that the authorized employee who applied the device is not at the facility.
 - b. A reasonable effort has been made to contact the authorized employee regarding the removal of the lockout/tagout device.
 - c. An approved supervisor accomplishes the removal of locks and/or tags or the supervisor's designee who is trained in lockout/tagout practices.
 - d. The authorized employee is informed that the device was removed before he/she returns to the facility to resume job functions.
 - e. Each step of the exception is documented in writing and signed by the supervisor.

20.5 Procedure Involving More Than One Person

1. In the preceding steps for lockout/tagout, if more than one person is required to lockout/tagout equipment, each shall place their own personal lockout/tagout devices on the energy-isolating device.
2. When an energy-isolating device cannot accept multiple locks or tags, a multiple lockout/tagout device (hasp) may be used. If lockout is used, a single lock may be used to lockout the equipment or machine with the key being placed in a lockout box or cabinet, which allows the use of multiple locks to secure it. Employees will use their own lock to secure the box or cabinet.
3. As each person no longer needs to maintain their lockout protection, that person will remove his or her own lock from the box or cabinet.



4. The last person to remove their lock and/or tag shall assume the responsibility stated under “Restoring Equipment or Machines to Normal Operations”.

20.6 Procedure Involving Shift or Personnel Change

1. When lockout/tagout procedure is in use and overlaps a shift change or a change in personnel performing the job task, the oncoming employee will apply their own lockout/tagout device at the lockout position on the equipment or machine.
2. Both employees must be present at the lockout/tagout change. The off-going employee will strike his/her name from the warning tag checklist and the oncoming employee will place his/her name on the warning tag checklist.
3. All other procedures remain the same.
4. If the work is completed and a lock remains on the equipment, nobody will remove it until the employee responsible for the lock is found or the supervisor of the employee investigates and ascertains that the equipment is safe to operate.

20.6.1 Special Conditions

During certain operations, it may be necessary to energize the equipment for a short period of time. Notify and direct employees in the immediate area to stay clear of the equipment. If you plan to deactivate the operation again, have the authorized person repeat the lockout procedures before work resumes.

20.7 Periodic Inspection

The supervisory personnel will ensure a periodic inspection of the energy control procedures at least annually to ensure that the procedures and requirements of this program are being followed. This can be done in conjunction with facility inspections or other safety program audits. If equipment is locked and/or tagged out less frequently than once a year, then a review of the procedures will be done prior to the start of work.

1. An authorized employee other than the persons using the energy control procedure being inspected will perform the actual inspection.
2. The inspection and follow up action will identify and correct any deviation or inadequacies observed.
3. The inspection will include a review of energy control procedures used by authorized employees for specific lockout/tagout of equipment or machines serviced, maintained, or repaired by the employee.
4. All inspections will be documented. The report shall include: Identity of the machine or equipment, date of inspection, employees included in the inspection, and the name of the person performing the inspection.



20.8 Electrical Work

This section does not include procedures for exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations. Prior to doing any electrical work, a qualified person must:

1. Lock out the system
2. Open the disconnect
3. Make a visual inspection of the electrical panel to ensure that all blades on knife switches are open or that the circuit is open
4. Check the voltage tester on a known energized voltage source
5. Check the voltage on the load side of the circuit to make sure it is de-energized
6. After performing the voltage test, re-check the tester on a known source to ensure that it was operating correctly
7. Remove any fuses that are in the motor disconnect box
8. Close the box and place a tag and his or her lock on the disconnect switch prior to doing any other work
9. Prior to working any capacitors, discharge and ground them, and then check with the voltage tester.

20.9 Tags

1. Standardized tags will be used at all facilities and/or at locations as required.
2. Lockout/Tagout tag. This tag to be used reads “Danger — Do not operate or Apply Power”. This tag will be completed and installed by each employee working on the equipment.
3. Tags and the procedures used to tagout equipment or machines will comply with the following standards:
 - a. The tag shall be of a durable material and shall identify the date and by name, the person applying the tag.
 - b. The tag shall warn against hazardous conditions and include a legend such as “Do Not Start,” “Do Not Operate,” or other such warnings.
 - c. The tag will be completed, signed off, and installed by each employee working on the equipment.
 - d. Tags shall be used in conjunction with locks whenever possible.
 - e. Tags and locks shall be of substantial strength to prevent removal without the use of excessive force.



20.10 Training

1. Each employee participating in activities of lockout/tagout shall be trained in the safety significance of the lockout/tagout procedure(s) and have the knowledge and skills necessary to carry out their program responsibilities.
2. Training will be given to authorized and affected employees prior to the start of work where lockout/tagout procedures are used.
3. Retraining will occur if new or revised control methods and procedures are introduced, any change in job assignments, machines, equipment, or processes that present a new hazard.
4. Employees shall also be retrained when a periodic inspection shows the employee deviates from or has inadequate knowledge of the energy control procedures or if supervisory personnel believe retraining is necessary.
5. All affected employees shall be trained in the purpose and use of the lockout/tagout procedures, the procedures being used in their workplace, and the prohibition against attempting to restart or reenergize a machine or equipment that's locked or tagged out.
6. Wherever a tag is used in lieu of a lock the employee must understand the significance and properties of the tag(s).
7. Authorized employees will be trained in:
 - a. The type and magnitude of energy available in the workplace.
 - b. Recognizing hazardous energy sources that apply
 - c. Methods and means to isolate and control energy.

Quick Reference

29 CFR 1910 Subpart J, The Control of Hazardous Energy

29 CFR 1926 Subpart K, Lockout and Tagging of Circuits

NFPA 70E



21.0 LADDERS AND STAIRWAYS

21.1 Scope and Purpose

The following information applies to access and egress issues exist using stairways, ramps and ladders. All portable ladders used in construction, alteration, repair (including painting and decorating), and demolition of work sites covered by OSHA's general industry and construction safety and health standards.

The purpose is to prevent injury to employees while accessing elevated work areas using ladders, stairs or ramps.

21.2 Guidance

1. A ladder, stairway, or ramp shall be provided at all personnel points of access where there is a break in elevation of 19" or greater.
2. Ladders, stairways and landings shall have unobstructed access at the top and base and be free of debris.
3. Manufactured ladders must be rated for extra heavy-duty work.
4. Contractors shall provide ladders which are safe and in accordance with all applicable codes and standards.
5. Employees that use ladders shall be trained by a competent person to recognize hazards and procedures to minimize those hazards:
 - a. The proper construction, placement, care, use and handling of ladders
 - b. The maximum intended load capacities of ladders that are used
 - c. Requirements of [29 CFR 1910.23 Ladders](#)
6. Contractors shall have a ladder safety inspection program with a competent person designated to make such inspections.
7. Ladders with broken or missing rungs or steps, broken or split side rails or other damage shall be immediately removed from service by tagging "out of service" and removing it from the work area by the end of shift.
8. Ladders shall not be painted with opaque material other than for identification marking.
9. Ladders made of conductive material shall not be used where electrical hazards exist.
10. Ladders shall be placed on a substantial base.
11. Ladders shall not be placed in passageways or doorways, unless the door is blocked open, locked shut, or guarded from opening into the ladder.
12. The area at the base of ladders should be delineated to safeguard others working in the area.



13. Ladders used in areas subject to vehicle traffic shall be demarcated around the base also.
14. Ladders shall not be used in a horizontal position as platforms, runways, scaffolds, or structural members.
15. When ladders are used for access to upper landing surfaces, ladder side rails shall extend not less than 36 inches (3 rungs) above a landing.
16. Ladders should be accessed using both hands, facing the rungs.
17. Ladders shall not be used by more than one person at a time unless so designed, and never more than two persons.
18. Tools should be retrieved by use of a rope haul or hoist so that 3-point contact is maintained.

21.3 Job-Made Ladders

1. Job-made ladders shall be constructed for their intended use. If a ladder is to provide the only means of access or exit from a working area for 25 or more employees, or simultaneous two-way traffic is expected, a double-cleat ladder shall be installed.
2. Double-cleat ladders shall not exceed 24 feet in length; single-cleat ladders shall not exceed 30 feet in length.
3. The width of single-cleat ladders shall be at least 15 inches, but not more than 20 inches, between rails at the top.
4. Side rails shall be parallel or flared top to bottom by no more than 1/4 inch for each 2 feet of length.
5. If possible, side rails should be continuous. If splicing is necessary to attain the required length, the splice must develop the full strength of a continuous side rail of the same length.
6. x 4 lumber shall be used for single cleat ladders up to 16 feet in length; 3-inch (or 2 x 6) lumber shall be used for single-cleat ladders from 16 to 30 feet in length.
7. x 4 lumber shall be used for side and middle rails of double cleat ladders up to 12 feet in length; 2 by 6-inch lumber shall be used for double-cleat ladders from 12 to 24 feet in length.
8. Cleats shall be inset into the edges of the side 1/2 inch or filler blocks shall be used on the rails between the cleats. The cleats shall be secured to each rail with common wire nails or other fasteners of equivalent strength. Cleats shall be uniformly spaced, 12 inches top to top.
9. Job-made ladders shall be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is approximately 1/4 of the working length of the ladder.



21.4 Portable Ladders

21.4.1 Extension Ladders

1. Extension ladders shall be equipped with anti-slip feet.
2. The fly section of an extension ladders shall not be used alone.

21.4.2 Stepladders

1. Stepladders shall only be used as designed, completely opened with latches locked.
2. The top two steps (top rung and top platform member of stepladders) are not to be used for access.

21.5 Stairways

1. Stairways having four or more risers or rising more than 30 inches or whichever is less, shall be equipped with:
 - a. At least one handrail; and
 - b. One stair rail system along each unprotected side or edge.
2. Metal pan treads and landings, when used for access prior to completion, shall be fitted with secured, temporary fillers long and high enough to cover the entire area.

21.6 Ramps and Inclined Walkways

1. Ramps and inclined walkways shall be eighteen inches or more wide.
2. They shall have standard railings when located four or more feet above the ground.
3. They shall not be inclined more than twenty-four degrees and shall be cleated or otherwise treated to prevent slippage and secured to prevent displacement.

NOTE: Double-headed nails shall not be used for the construction of ladders, stairways, or ramps.

21.7 Training

Train each employee to recognize hazards in the use of ladders, such as:

1. Fall hazards in the work area,
2. The procedures for erecting, maintaining, and disassembling fall-protection systems,
3. Their proper use and placement,
4. Their maximum intended loads,
5. Retrain employees as necessary to maintain their understanding and knowledge of safe ladder use.



Quick Reference

29 CFR 1926.951(c) Tools and protective equipment

29 CFR 1926.1053 Ladders

ANSI A14.3 Ladders-fixed, safety requirements

ANSI A14.2 Ladders-portable metal, safety requirements

ANSI A14.5 Ladders-portable reinforced plastic, safety requirements

ANSI A14.1 Ladders-portable wood, safety requirements

ANSI A14.4 Ladders-job-made, safety requirements



22.0 ELECTRICAL SAFETY

22.1 Scope and Purpose

This section is the minimal guidance for electrical and non-electrical workers.

The purpose of the section is to reduce the exposure to electricity and reduce accidents at the work site. The Contractor will ensure that each employee is fully trained to recognize electrical hazards.

22.2 Guidance

Electricians should wear approved, protective rubber gloves and rubber boots when they perform hot electrical work. Other insulators include wood, ceramic, fiberglass and glass.

22.3 Electric Inspection on Construction Sites

Electrical extension cords are numerous on construction sites. They become damaged because of the rough conditions they are used in. Inspect to ensure:

1. All extension cords are three-wire cords
2. Ground pin is on male plug
3. Unbroken insulation on cord
4. End appliances (plug and receptacle) are gripped to insulation
5. All wires are continuous and unbroken
6. All cords are protected from damage, likely to occur when passing through a door or window
7. Metal boxes with knockouts are not used on extension cords
8. Plugs are dead-front (molded or screwed in place)
9. Romex (non-metallic sheathed cable) is not used as flexible cord
10. Cords are not stapled or hung from nails
11. Bushing is passing through holes in covers or outlet boxes
12. Temporary lights not supported by their cords
13. Bulb guards on temporary lights
14. Electrical power tools with non-deadman switches have magnetic restart (when injury to the operator might result if motors were to restart following power failures)
15. Provisions to prevent machines from automatically restarting upon restoration of power in place
16. Outlets do not have reversed polarity
17. Power tools are double-insulated or have a ground pin



18. All exposed electric more than 50 volts guarded so no one can come in contact (receptacles, lightbulb sockets, bare wires, load center, switches); can be guarded by:
 - a. Approved enclosures
 - b. Location in a room, vault or similar enclosure accessible only to qualified persons
 - c. Suitable permanent, substantial partitions or screens arranged so only qualified persons have access to the space within reach of live parts
 - d. Location on a suitable balcony or platform elevated and arranged to exclude unqualified persons
 - e. Elevation of 8 feet or more above the working surface.

22.4 Ground-fault Circuit Interrupters (GFCI)

1. All 125-volt, single-phase, 15- and 20-ampere receptacle outlets that are not a part of the permanent wiring of the building or structure and that are in use by personnel will have GFCI protection for personnel.
2. The Contractor will provide GFCI protection for personnel if a receptacle or receptacles are installed as part of the permanent wiring of the building or structure and used for temporary electric power
3. On construction sites, contractor must take precautions to aid the effective operation of GFCIs
4. Most laboratory-tested appliances have 0.5 mA leakage or less under normal operating conditions. However, moisture and improper maintenance on portable hand-held power tools common at construction sites can create conditions in which GFCIs may trip
5. Expect portable cords with standard cap and connectors, when dropped in water, to cause leakage currents (100 to 300 mA or greater) far in excess of GFCI trip currents. Motors with dirty brushes, carbon-tracking on commutators, or moisture in the windings contribute to leakage current.
6. Do not subject panel boards, receptacles, and cord caps and connectors intended for dry locations to moist conditions
7. Centrally locate construction receptacles so employees can use cords of 150 feet or less, with a sufficient number of circuits used to keep the number of tools on a circuit to a minimum
8. Do not have receptacles on the same circuit as lighting or other uses
9. Perform periodic maintenance of all motors used on construction sites



22.5 Portable Generators

Under the following conditions, you need not ground the frame of a portable generator, which can serve as the grounding electrode for a system supplied by the generator:

1. The generator supplies only equipment mounted on the generator or cord- and plug-connected equipment through receptacles mounted on the generator or both,
2. The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

The Contractor need not protect with GFCIs receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated at not more than 5kW (kilowatts), where the circuit conductor of the generator is insulated from the generator frame and all other grounded surfaces.

Quick Reference

[29 CFR 1910 Subpart S Electrical](#)

[29 CFR 1926 Subpart K Electrical](#)

[NFPA 70 E Standard for Electrical Safety in the Workplace](#)



23.0 SCAFFOLDING

23.1 Scope and Purpose

Contractors will comply with the requirements of [29 CFR Part L Scaffolds](#). The guidance in this manual is minimal guidance. You can obtain further information from [ANSI/ASSP A10.8-2019 Scaffolding Safety Requirements](#) and [29 CFR 1926, Subpart L Scaffolds](#).

23.2 Guidance

23.2.1 Scaffold Erection

Erection and dismantling of scaffolding must be done under the direct supervision of a competent person. Specific requirements for differing scaffolds are addressed later in this section. The following items are required of all scaffolding:

1. All components must be free of damage,
2. Planking must be scaffold grade,
3. Unless planking is secured, it must extend a minimum of 6 inches over bearer but not exceed 12 inches,
4. Contractor must provide safe access,
5. Keep scaffold free of debris or slippery substances,
6. All x-braces must be in place,
7. An 18-inch minimum platform width is recommended,
8. Erect scaffold away from energized or unguarded power lines,
9. If erected over walkways or traffic areas, place 18-gauge screen or equivalent in place to prevent items from falling off,
10. All scaffold components, including casters, must be capable of supporting, without failure, their own weight and at least four times the maximum intended load.

23.3 Supported Scaffolds

When erecting a scaffold from the ground up, give special attention to footing. It must be solid and stable. Mudsills are suggested, but you should not use block, brick, and similar items. The scaffold must be erected plumb and level. The installation of all x-braces will assist in this goal. Fall protection, such as guardrails and toe boards, is not required at a height of 10 feet. Lock pins should be in place to prevent frame separation. Secure the scaffold to the building or structure if it will exceed 26 feet in height or a horizontal length greater than 30 feet.

23.4 Manually Propelled Mobile Scaffolds

1. Do not build manually propelled mobile scaffolds higher than three times their minimum base dimension.
2. Use horizontal or diagonal bracing to prevent racking



3. Supporting casters are required to have operating locks on them and to be engaged while the scaffold is occupied
4. Fully plank mobile scaffold work platforms
5. Take special care to avoid striking piping, electric lines, or other obstructions when moving scaffolds
6. Secure or remove tools, materials, and equipment from the platform prior to relocation
7. Do not allow employees to ride a moving scaffold
8. Guard railing is the same as for stationary scaffolds

23.5 Suspended Scaffolds

Suspended scaffold support devices must be capable of sustaining four times the intended workload. The suspension ropes (wire, synthetic or fiber) must be capable of sustaining six times the intended workload. Protect employees through the use of a body harness attached to their individual lifelines. To prevent the platform from swinging, secure to the building or structure.

23.6 Ladder Jack Scaffolds

Limit ladder jack scaffolds to light-duty use. Their height should not exceed 20 feet. Use heavy-duty ladders (Type 1A) to support the platform and workload. If bearing on the rungs only, the bearing area should include at least 10 inches of bearing on the rung. The platform should be a minimum of 12 inches wide. If you use wood planks, provide support every 8 feet.

23.7 Metal-bracket and Form Scaffolds

Secure metal-bracket and form scaffolds by either welding or bolting in place. Use clip-on or hook-over brackets if the form walers are secured in place. The maximum permissible span is 8 feet. Standard guard railing and toe boards are required.

23.8 Stilts

Equip stilts with skid-resistant feet and use them in accordance with manufacturer's recommendations.

23.9 Training

The Contractor shall ensure that training of affected employees meets [29 CFR 1926.454 Training Requirements](#).

Quick Reference

[29 CFR 1910.27, Walking-Working Surfaces](#)

[29 CFR 1926.451, Scaffolding, General Requirements](#)

[29 CFR 1926.452, Additional requirements](#)



29 CFR 1926.453, Aerial lifts

29 CFR 1926.454, Training

ANSI A10.8, Scaffolding safety requirements

ANSI/SIA A92.5, Boom-supported elevating work platforms

ANSI/SIA A92.3, Manually propelled elevating work platforms

ANSI A14.7, Mobile ladder stands & mobile platforms

ANSI A120.1, Powered platforms for building maintenance



24.0 AERIAL LIFTS

24.1 Scope and Purpose

There are varieties of aerial lifts included within [29 CFR 1926 Subpart L](#), including extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers, or a combination of any of these devices. This section's information applies to any company-owned, leased, and borrowed equipment.

24.2 Manufacturers' Information

Manufacturers of aerial lifts provide important information about the lift that the end user must be familiar with, including:

1. Warnings, cautions or restrictions for safe operation and maintenance,
2. Make, model, serial number, and manufacturer's name and address,
3. Rated workload, including number of occupants,
4. Maximum travel height,
5. Nominal voltage rating of batteries,
6. Notice to study the operator's manual,
7. Notice of required inspections,
8. Alternative configuration use statement such as: outriggers, platform extension, and attachments and extendible axles,
9. Notice if platform or other parts are electrically insulated,
10. Warning on key-part replacement.

24.3 User Responsibilities

To ensure safe usage of aerial lifts, users must:

1. Maintain copies of operating/maintenance manuals,
2. Inspect and maintain to manufacturer's specifications,
3. Provide operator training,
4. Instruct operator on intended purpose and function of each control,
5. Read and understand manufacturer's operating instructions and user's safety rules,
6. Understand all instructions, warnings, and decals displayed on lift,
7. Demonstrate proficiency and knowledge on the same model type.

24.4 Inspections

Base inspection procedures for aerial lifts on information provided by the manufacturer. Manufacturers provide various inspection intervals due to component function and wear,



and deterioration that could affect component life. Frequent inspection items should include:

1. All functions and their controls for speed(s), smoothness, and limits of motion
2. Lower controls, including provisions for overriding the upper controls
3. All chain and cable mechanisms for adjustment and worn or damaged parts
4. All emergency and safety devices
5. Lubrication of all moving parts, inspection of filter elements, hydraulic oil, engine oil, and coolant
6. Visual inspection of structural components and critical components
7. Placards, warnings, and control markings
8. Any additional items specified by the manufacturer.

There also are daily prestart inspection procedures that should include quick visual checks and proper function of the following items:

1. Operating and emergency controls
2. Safety devices
3. Personal protective devices
4. Air, hydraulic, and fluid leaks
5. Cables and wiring harnesses
6. Loose or missing parts
7. Tires and wheels
8. Placards, warnings, control markings, and operating manuals
9. Outriggers, stabilizers, and extendible axles
10. Guardrail system and access gates and openings
11. Load and its distribution on platform and any platform extensions
12. Any other items specified within the manufacturer's operating manual.

24.5 Operating Procedures

Before any work is started and while work is being performed from an aerial lift, contractor must address various site inspection and operating procedures, including:

1. Avoiding drop-offs, holes, or bumps
2. Checking for floor obstructions and debris
3. Avoiding grades, slopes, and ramps
4. Watching for overhead obstructions/high voltage conductors
5. Being aware of wind and weather conditions



6. Providing adequate surface support
7. Looking out for hazardous locations
8. Operating the platform on a surface within limits specified by the manufacturer
9. Using stability-enhancing means as manufacturer requires
10. Closing guardrails, access gate or openings per manufacturer's instructions
11. Making sure the load and its distribution are within manufacturer's rated capacity
12. Ensuring adequate clearance from overhead obstructions
13. Having personnel wear required safety gear
14. Maintaining maximum safe approach distance to energized lines and parts
15. Determining hazardous locations
16. Maintaining a firm footing on the platform floor
17. Taking precautions for any other moving equipment operating in the same area
18. Preventing ropes, electric cords, hoses, etc., from entangling with the platform
19. Following rated capacities
20. Clearing personnel and equipment from surrounding areas before lowering the platform
21. Shutting down the engine while fueling
22. Charging batteries in well-ventilated areas free of flames, sparks, and other hazards that could cause a fire
23. Not using other objects to steady the platform
24. Not using aerial lifts as cranes
25. Limiting travel speed to travel conditions
26. Limiting platform travel height to no more than twice the base width
27. Avoiding stunt driving and horseplay
28. Not altering safety devices or interlocks
29. Driving on grades, slopes, or ramps only within the manufacturer's ratings
30. Ceasing operation if any suspected malfunction occurs
31. Permitting only manufacturer's authorized alterations to be made
32. Reporting problems or malfunctions immediately to the supervisor
33. Reporting potential hazardous locations immediately to the supervisor.



24.6 Fall Protection

1. Operators of extensible and articulating boom lifts must wear a body harness with a lanyard attached to the boom or basket when working from an aerial lift.
2. Operators of ladder trucks and tower trucks must wear a body harness with attached lanyard. The manufacturer's information provided with the lift device includes the proper attachment points and procedures.
3. There are no requirements for the wearing of a body harness and lanyard while working from a scissor-type lift.

Quick Reference

29 CFR 1910 SUBPART F, 1910.66 — 68, 1910.269

29 CFR 1926.453 Aerial lifts

ANSI/SIA A92.2-1990 Vehicle-mounted elevating and rotating aerial devices

ANSI/SIA A92.6-1990 Self-propelled elevating work platforms



25.0 POWERED INDUSTRIAL TRUCKS (Forklifts)

25.1 Scope and Purpose

This section outlines minimum safety requirements to be followed by Contractor personnel operating and maintaining powered industrial trucks (forklifts) on EMBARK projects. The purpose is to eliminate or minimize the potential for injury or property damage to personnel, equipment, and facilities.

25.2 Guidance

All powered industrial trucks in use by the Contractor shall meet the applicable requirements of design, construction, and stability as defined by the [ANSI B56.1-1969, Safety Standards for Powered Industrial Trucks](#). All powered industrial trucks acquired and used by the Contractor on or after March 1, 2000, must meet the applicable requirements of design, construction, and stability as defined in [ASME B56.1-1993](#). The Contractor must ensure that all powered industrial trucks are inspected, maintained, and operated in accordance with this section and the manufacturer's recommendations and specifications.

1. Trucks shall have a label indicating approval by the testing laboratory as meeting the specifications and requirements of [ANSI B56.1-1969](#).
2. Modifications or additions shall only be performed with the manufacturer's prior written approval. When modifications or additions are made, capacity, operation, and maintenance instruction plates, tags, and decals must be changed accordingly.
3. If the truck is equipped with front-end attachments other than factory-installed attachments, it must be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with the load centered from side to side.
4. The user must ensure that all nameplates and markings are in place and legible.
5. Gasoline and un-scrubbed diesel-powered industrial truck use is forbidden indoors.
6. When carbon emission producing equipment is utilized indoors, the Contractor shall have an accepted plan in place to monitor and mitigate the hazards to workers.
7. Before making a critical pick, the Contractor shall perform a job hazard analysis.
8. Forklifts shall not be used to lift personnel under any circumstances!

25.3 Lighting for Operating Areas

Adequate lighting shall be provided in operating areas. Where general lighting is inadequate, directional lighting must be provided on the truck.



25.4 Operator Requirements for Powered Industrial Trucks

25.4.1 Safe Operation

1. The Contractor shall ensure that each powered industrial truck operator is trained in the safe operation of a truck and is competent to operate a powered industrial truck safely.
2. Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the Contractor must ensure that each operator has successfully completed the training required by this section.
3. Operators must be in possession of training certification card.

25.5 Operating Powered Industrial Trucks

Industrial Trucks (Forklifts) shall be inspected at the beginning of each shift or when first used on that shift. Inspections shall be recorded on a daily inspection sheet. If an operational or mechanical defect is found, the equipment shall be tagged out of service until proper repairs have been made. Prior to using a forklift during the shift, the operator shall check the daily inspection sheet to ensure the inspection for that day has been completed.

1. No operator may drive a truck up to anyone standing in front of a fixed object.
2. The truck shall have an audible reverse alarm.
3. No one may stand or pass under the elevated portion of any truck, whether loaded or empty.
4. Contractors must not allow persons to ride on industrial trucks.
5. Contractors must prohibit employees from placing any body parts between the uprights of the mast or outside the running lines of the truck
6. When an operator leaves the seat/controls of a powered industrial truck unattended:
 - a. The forks or load shall be lowered to the ground;
 - b. The controls shall be neutralized;
 - c. The power shall be shut off with key removed; and
 - d. The brakes shall be set.
 - e. If the truck is parked on an incline, the wheels shall be blocked.
7. The operator must maintain a safe distance from the edge of ramps or platforms while operating on any elevated dock, platform, or freight car. Floor stops may be required.
8. There shall be enough headroom for trucks to operate under overhead installations, lights, pipes, sprinkler systems, or other overhead projections.



9. An active operator protection restraint device (such as a seatbelt or lap-bar) or system shall be used.

25.6 Traveling in a Powered Industrial Truck

1. The operator shall remain at a safe distance of approximately three truck lengths from the truck ahead. The truck must be kept under control at all times.
2. Passing other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations is prohibited.
3. Railroad tracks must be crossed diagonally wherever possible. The operator must not park closer than 25 feet from the center of railroad tracks.
4. The operator shall look in the direction of, and keep a clear view of the path of travel.
5. Stunt driving and horseplay are prohibited.
6. The operator shall avoid running over loose objects on the roadway surface.

25.7 Traveling Speeds of Powered Industrial Trucks

1. The operator shall observe all traffic regulations, including authorized site speed limits.
2. The operator shall slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load obstructs a forward view, the driver must travel with the load trailing.

Exception: If traveling with the load trailing creates new hazards, it is not required.

3. The operator shall ascend and descend grades slowly.
4. At grades over 10 percent, loaded trucks must be driven with the load upgrade.
5. Unloaded trucks should be operated on all grades with the load carrier downgrade.
6. On all grades the load and load carrier shall be tilted back if applicable and raised only as far as necessary to clear the road surface.
7. Under all travel conditions, the truck shall be operated at a speed that will permit it to be stopped safely.
8. The driver shall slow down for wet and slippery floors.
9. While negotiating turns, the operator shall slow to a safe speed and turn the wheel in a smooth, sweeping motion.

25.8 Loading Powered Industrial Trucks

1. All loads shall be within the rated capacity of the truck.



2. All loads shall be stable or safely arranged. Exercise caution when handling off-center loads that cannot be centered.
3. Take care when securing, manipulating, positioning, and transporting loads when attachments are used.
4. Place the load carrier under the load as far as possible. Tilt the mast backward to stabilize the load.
5. Use extreme caution when tilting the load forward or backward, particularly when high tiering. Avoid tilting the load forward with the load carrier elevated except to pick up a load, or when the load is in a deposit position over a rack or stack. When stacking or tiering, use only enough backward tilt to stabilize the load.
6. When stacking or tiering, ensure that other workers are not on the back side and subject to being struck by a falling load.

25.9 Maintaining Powered Industrial Trucks

1. Industrial trucks shall be removed from service when not in safe operating condition. An authorized employee must make all repairs.
2. When repairs to fuel and ignition systems of industrial trucks involve fire hazards, a fire extinguisher shall be available.
3. Industrial trucks in need of repairs to the electrical system must have the battery disconnected prior to such repairs.
4. Industrial truck parts must be replaced only by parts of equivalent safety.
5. Industrial trucks must not be altered so that the relative positions of parts are different from when they were manufactured.
6. Trucks must not have additional counterweight added unless approved by the truck manufacturer.
7. Industrial trucks must be kept clean and free of excess accumulations of combustible materials, oil, and grease.

25.10 Training

The construction industry is mandated to provide adequate, organized, and documented training for all employees using PITs. Retraining must be provided to an operator if three years have elapsed since they last received training.

Quick Reference

[29 CFR 1910.178 Powered Industrial Trucks](#)

[ASME B56.1-2020 Safety Standard for Low, High Lift Trucks](#)



26.0 MOBILE EQUIPMENT

26.1 Scope and Purpose

The general principles for safe, productive motor-vehicle operation are applicable to all motor-vehicle operations, including vehicles that operate within an off-highway job site, not open to public traffic.

26.2 Guidance

Safe, productive motor-vehicle operation requires:

1. A qualified operator, trained and experienced in the operation of the vehicle to which he or she is assigned. This person should be in good physical condition with his or her judgment unimpaired by drugs, alcohol, or fatigue,.
2. An operable, well-maintained motor vehicle — a vehicle in good mechanical condition with all controls identified and fully functional
3. A daily, pre-operation inspection system — to verify the vehicle's condition using a checklist specific to the vehicle or using a general, logical system. The operator should:
 - a. Check fluid levels (cooling, oil, hydraulic, fuel, etc.)
 - b. Check that the emergency brake and parking brake are set and transmission is not in gear
 - c. Start engine and allow the various systems to warm up to operating temperatures
 - d. Check the vehicle to be sure that all glass, mirrors, lights, and reflectors are clean and intact
 - e. Check tires to ensure that treads and sidewalls are in good condition, and that they are properly inflated (if pneumatic). Check grousers, idlers and drive sprockets of tracked vehicles.
 - f. Check the vehicle's controls for their proper function, e.g., horn, windshield wipers, steering, transmission, etc. If all is in order, proceed.
4. An operator's guide — to give the operator an idea of what is expected, such as smooth operation with speeds consistent with the existing job site. Always follow the established traffic patterns and haul routes for the job site.
5. A parking/shutdown procedure — to secure the vehicle. Park on as level a surface as possible and as applicable: parking brake set, wheels cramped up-slope and/or blocked, bowl, bucket, or blade on the ground and with the tampering or vandalism potential minimized.

Quick Reference

[29 CFR 1910.176 Handling Materials](#)

[29 CFR 1926.600 Equipment](#)



27.0 EARTH WORK AND HEAVY EQUIPMENT

27.1 Scope and Purpose

This section defines minimum safety requirements for earth moving operations, maintenance and fueling, site conditions and the safety of the general public. Equipment is defined to include motor vehicle, earthmoving equipment and over the road and onsite haul trucks.

The purpose is to safeguard employees and members of the public, and to eliminate equipment and property damage.

27.2 Guidance

1. The Contractor shall insure that only experienced, trained and qualified personnel are allowed to operate equipment.
 - a. Proper licensing requirements such as Commercial Driver's License (CDL) shall be met.
 - b. The operator must:
 - I. Know, understand, and demonstrate the working limits and safe operation of the equipment, including any attachments
 - II. Must be physically, emotionally, and mentally fit
 - III. Must know and comply with the safety rules and attend at a minimum at least one toolbox safety meeting per week
 - IV. Must have read and understood the manufacturers operating instructions for the equipment they are operating
 - V. Must be qualified and checked out on the specific equipment they will be operating.
2. The operator is personally responsible for the safe operation/movement of the equipment.
3. All personnel on the project shall utilize proper Personal Protective Equipment. All equipment shall be inspected and serviced by a qualified mechanic on a pre-determined schedule. Such inspections shall be documented.
4. In the course of the work shift, it shall be operator's responsibility to report unsafe conditions that arise with the equipment or on the site.
5. Any equipment unsafe to operate shall be taken out of service and repaired.
6. All cab glass shall be safety glass, or the equivalent, that introduces no distortion.
7. Smaller vehicles such as pick-up and maintenance trucks shall be equipped with strobe/beacon lights to enhance visibility around equipment.



8. The use of seat belts is mandatory while operating equipment or riding in vehicles.
9. Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried.
10. All equipment and heavy-duty vehicles shall be equipped with a reverse signal alarm distinguishable from the surrounding noise level. Ambient noise sensing variable volume alarms may be required for night operations.
11. Backing of trucks with limited visibility shall have a spotter or video device to allow the vehicle operator to ensure that no workers are present in the area behind the vehicle and subject to being struck.
12. When parked on an incline where there is no curb or berm, the wheels shall be chocked or blades or dump bodies lowered.
13. Operators shall climb up and down from the equipment using the proper steps/handholds.
14. No person other than the operator shall ride on equipment or in a vehicle that is not specifically designed to carry passengers.
15. No employee shall be allowed to ride in or work from an end-loader bucket.
16. Equipment shall not be moved until the operator is sure that all individuals are clear of the equipment.
17. Equipment operated near energized power lines shall follow the guidelines in OSHA and the NFPA. All power lines shall be considered energized until supervision has verified that they are de-energized.
18. All vehicles shall have a service brake system capable of stopping and holding the equipment fully loaded an emergency brake system, and a parking brake system.
19. Equipment shall not be loaded beyond their rated capacities and all loads shall be secured to prevent shifting or loss.
20. When “breaker point”, brush cutting, or other specialty attachments are utilized the Contractor shall follow the manufacturer’s recommendations for cab/operator protection. Manufacturer’s safety precautions shall be incorporated in the JHA.
21. No persons shall be permitted to remain in equipment that is being loaded by excavating equipment unless the cab is adequately protected against heavy impact.
22. Contractors shall have a procedure in place to deal with the hazards associated with “quick release” bucket mechanisms. A positive locking pin shall be placed to prevent accidental release if so equipped.



27.3 Maintenance, Repair and Fueling

1. All equipment and vehicles in use shall be inspected at the beginning of each shift to assure that equipment and accessories are in safe operating condition and free of apparent damage that could cause failure. Items to be checked shall include, but are not limited to:
 - a. Operating Controls
 - b. Brakes
 - c. Seat and Seat Belt
 - d. Windshields and Wipers
 - e. Tires
 - f. Reverse Alarm
 - g. Horn
 - h. Steering Mechanism
 - i. Lights
 - j. Steps and Handholds
 - k. Hydraulic Hoses
 - l. Fire Extinguisher
2. Heavy equipment or vehicles which are suspended or held aloft by the use of slings, hoists, or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Likewise, bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment shall be either fully lowered or blocked when being repaired or not in use.
3. Equipment being repaired or adjusted shall have the key removed and a tag-out device placed on the control panel.
4. Only maintenance persons trained in the operation of equipment shall be allowed to move such equipment.
5. Equipment with obvious hydraulic, coolant, or oil leaks shall be promptly repaired.
6. Fuel storage and maintenance areas shall be kept clean and free of debris and spilled material. Oily and greasy rags shall be properly stored.
7. Proper fire protection, flammable liquid storage, and cutting and welding procedures shall be followed.
8. Gasoline powered engines shall be shut off to refuel
9. No smoking or ignition sources shall be allowed within 35 feet of a fueling operation.



27.4 Site Control

1. Yield the right-of-way to all equipment!
2. All visitors to the site shall check in with the Contractor's supervision or grading supervisor.
3. Haul routes shall be built in accordance with applicable standards. Turnouts, emergency ramps, and berms shall be provided where needed.
4. Haul routes shall be properly maintained to prevent injury to employees and damage to equipment.
5. Where haul routes cross established roads or other haul routes, flaggers or warning signs shall be posted.
6. Berms or barricades shall be provided and maintained on roadways where drop-offs of sufficient grade or depth exist. They shall be at least mid-axle height of the largest equipment that travels the roadway.
7. Equipment speeds shall be appropriate to site and weather conditions if speed limits are not posted.
8. All equipment left unattended at night adjacent to a roadway in normal use, or adjacent to construction areas where work is in progress, shall be barricaded in conformance with the Uniform Traffic Code.
9. Everyone on the ground working around moving equipment shall wear high visibility vests or garments.
10. Before driving through or within an equipment operation, stop and observe long enough to become familiar with what equipment is working, or how much equipment is working.
11. When stopped to observe, be aware that material can come off of the top of the haul units, especially when they are in a turn.

27.5 Compaction Testing in Active Earthwork Fills

1. Technicians working among active earthmoving equipment shall utilize proper PPE including hard hats, high-visibility vest, and appropriate footwear.
2. Technicians will be required to communicate with the grading supervisor to determine when fill areas are ready for testing, and the best routes for entering and leaving the fill area.
3. In large fills, if at all possible, tests should be performed at a safe distance from equipment traffic. Technicians shall enter the fill areas by traveling with the flow of the equipment traffic, and take all prudent steps to avoid unsafe situations.
4. Technicians shall make contact with equipment operators and shall not proceed into the paths of equipment unless the operator has given them a positive hand signal to do so.



5. Technicians and grading supervision shall communicate to ensure test pits are located and quantified in accordance with project requirements for testing.
6. Technicians should place their vehicles at the open end of the test pit, place a signal flag in the spoil pile at the closed end while keeping their strobe/beacon light “on” at all times while in the fill.
7. When leaving the test pit, technicians should check the immediate surroundings to ensure no obstacles are in the way of making a safe vehicle exit. If such obstacles are present, they shall promptly inform the grading supervisor of the situation and remain at the test pit until it is safe to exit.
8. Technicians shall leave the fill by traveling with the flow of the equipment traffic.

27.6 Public Safety

1. No Contractor shall move or cause to be moved construction equipment or vehicles upon any access roadway or grade unless the access roadway or grade is constructed and maintained to accommodate safely, the movement of the equipment or vehicles involved.
2. Where trucks enter public highways, or cross-established routes, warning signs or flaggers shall be posted to alert the traveling public.
3. Equipment operated on public roads shall be equipped with functioning lights, overhead beacon or strobe, and a slow-moving vehicle placard. In addition, equipment shall be escorted by a vehicle licensed for public roads when traveling from one location to another.
4. Before vehicles exit the project, they shall have had all loose or excess material removed.
5. All roadways used by the traveling public shall be kept clear of spilled material.
6. Drivers shall obey all posted speed limits and operate their vehicles in accordance with road/weather conditions.
7. Loads in or on vehicles shall be secured or covered.

Quick Reference

29 CFR 1926 Subparts W, P

MUTCD



28.0 PUBLIC HAZARD CONTROL

28.1 Scope and Purpose

This section defines minimum requirements for the protection of the general public subject to hazards arising from operations connected with the construction, maintenance and repair, and demolition of structures in the vicinity of the work. The purpose is to evaluate and prevent or reduce to a minimum injury to persons or their property while accessing EMBARK facilities and project sites.

28.2 Guidance

EMBARC facilities are operating facilities that must remain in full operation unless other provisions are made. The Contractor shall conduct all operations with the least possible obstruction and inconvenience to EMBARK, Franchisees and the public.

1. The Contractor shall develop a Public Hazard Control Plan in concert with the Work Zone/Traffic Control Plan, or if no Traffic Control Plan is required, a standalone Public Hazard Control Plan. The plan shall ensure the safety of passengers, employees, suppliers, and vendors traveling on EMBARK property, roadways, sidewalks, stations, stops, or any area accessed by the public where work is being performed. All operations taking place above or adjacent to vehicular and pedestrian traffic areas shall be addressed.
2. The Contractor shall be responsible for the placement and maintenance of all devices and signage required for the protection of the public.
3. The Contractor shall perform daily inspections of the work to ensure their plan is fully implemented and operational. All inspections shall be documented.
4. All necessary measures shall be taken to prevent any materials from migrating from the work site into areas occupied by the public. This includes, but is not limited to dust, mud track-out, debris, construction materials, liquids, mists, vapors, and fumes.
5. Barricades shall be provided to delineate the work area from areas used by the public. The barricades shall be suitable for the hazard and location.
6. The Contractor shall construct dust, vapor, fume, and smoke-proof enclosures to separate the work area from the central Heating, ventilation, Air Conditioning system and public whenever welding, dust, vapor, or fume generating activities take place.

28.3 Hazards to Consider

28.3.1 Traffic Hazards

1. The Contractor shall prepare a traffic control plan. The plan shall be in accordance with the Work Zone/Traffic Control section.



2. The Contractor shall provide and maintain controls as required to warn and protect its employees, EMBARK employees, and the public from injury or damage caused by the Contractor's operations.
3. No work shall be performed on or adjacent to any vehicular or pedestrian roadway/walkway until all necessary signage and traffic control devices have been approved and are in place.

28.3.2 Pedestrian Hazards

1. At all times during construction, areas designated for pedestrian traffic shall be clearly delineated and maintained so that no hazard to the public exists.
2. Public areas adjacent to the work shall be protected to reduce hazards to pedestrians from falling objects and debris.
3. Pedestrian barriers and enclosures shall be built to the specifications found in the MUTCD and ANSI.
4. Where pedestrian access is impacted, suitable safe access shall be provided. The pathway shall be clearly marked with lighting provided.
5. Ensure that hazards that may cause slipping, tripping, or falling are eliminated or minimized.
6. Non-level surfaces shall be delineated with high visibility markings and/or signage.
7. Stairs, ramps, and elevated walkways shall be provided with standard guardrails. Those exposed to weather shall be constructed with non-slip surfaces.
8. All welding, cutting, and grinding operations shall be provided with shields. Welding fumes shall be mitigated.

28.3.3 Illumination

1. In public areas, the Contractor shall provide temporary lighting for the duration of operations to maintain lighting levels present prior to the beginning of work.
2. All walking surfaces, pathways, stairs, tunnels, ramps, bridges, and bridge crossings shall be adequately illuminated at all times.
3. All construction lighting shall be directed or shielded so as not to become a hazard to vehicular or pedestrian traffic.
4. Daily inspections of these areas shall be performed.

28.3.4 Falling objects and windblown objects

1. Where there is a possibility of objects, tools, construction materials, or debris to fall, be blown, or otherwise be propelled into public areas or onto roadways, the Contractor shall install barriers, catch platforms,



enclosures, debris netting, or implement other administrative or engineering controls.

2. Controls that are implemented shall be of sufficient strength to prevent public impact.

28.3.5 Security

1. Provide security and facilities to protect the work and EMBARK's operations from unauthorized entry, vandalism, and theft.
2. The construction area shall be closed to the public at all times.
3. For outdoor areas, a 6-foot chain link fence with gates or equivalent shall be provided around the perimeter of the site during the entire length of construction unless approved otherwise by EMBARK.
4. The 24-hour contact number(s) of the person(s) responsible for security of the work area shall be furnished.

Quick Reference

Manual of Uniform Traffic Control Devices

ANSI A10.34-2001



29.0 WORK ZONE PROTECTION-TRAFFIC CONTROL

29.1 Scope and Purpose

Workers such as emergency responders, clean-up, utility, demolition, construction, and others in areas where there are moving vehicles and traffic are exposed to being struck by moving vehicles. Work zones are used to move traffic in an approved direction and are typically identified by signs, cones, barrels, barriers, and flagging activities.

There must be a traffic control plan for the movement of vehicles in areas where there are also workers conducting other tasks. Drivers, workers on foot, and pedestrians must be able to see and understand the routes they are to follow. The authority in charge, Federal, state, or local, will determine the configuration of the temporary traffic control zone for motorists and pedestrians. The Construction Project Manager will determine the internal traffic control plan within the construction/demolition worksite. When there are several projects, coordinated vehicle routes and communication between contractors will reduce vehicular struck-by incidents. The **MUTCD** and **ANSI 10.47-2015** address temporary traffic control and associated plans and activities.

The purpose of this section is to assist in the development and implementation of a work site traffic control plan. A Temporary Traffic Control (TTC) plan, in detail appropriate to the complexity of the work project or incident, should be prepared and understood by all responsible parties before the site is occupied. A traffic control officer/traffic control plan specialist/site safety officer should initiate and coordinate the development and implementation of an TTP for all job sites. Any changes in the TTC plan should be approved by an official who is knowledgeable (for example, trained and/or certified) in proper TTC practices. Where a recognized hazard is not addressed the employees will consult with supervision and when necessary, EMBARK.

Traffic control and the use of flaggers shall comply with the most current **MUTCD**. Certified flaggers and/or Streetcar flagger shall be utilized when construction operations impact the right-of-way and/or traveled roadways. Contractors shall maintain records of flagger certifications.

29.2 Guidance

The procedures below are not all inclusive but rather highlight safety protocols that should be followed. It is expected that the Contractor will develop and implement a comprehensive temporary traffic control plan in compliance with the **MUTCD**, Section 6 of this manual, ODOT, local, and EMBARK rules and procedures.

1. At all work sites where a work zone is set up, there will be an employee who is knowledgeable in traffic control principles who will act as a traffic control supervisor. The traffic control supervisor is responsible for:
 - a. Ensuring that these rules are adhered to
 - b. The safety of the work zone setup
 - c. Temporarily halting work until unsafe conditions related to temporary traffic control have been eliminated



- d. Evaluating the effectiveness of the temporary traffic control setup
 - e. Documenting work zone setup and changes throughout the course of the project
 - f. Conducting a job briefing/tailgate meeting with the flagger and members of the crew in the work zone each time the flagger is assigned to a new project or when job site conditions change significantly
 - g. Providing, communicating, and keeping a current site-specific traffic control plan on site, when required
 - h. Avoiding using flaggers whenever possible and using traffic management systems such as lane shifts, portable traffic signals, or remote signaling devices operated by workers away from the flow of traffic. If there is doubt that effective protection can be achieved by signs, signals, and barricades, flaggers or other appropriate traffic controls shall be used.
2. If a flagger is used, the flagger should have the authority to recommend to the Employee in charge that operations be temporarily halted to correct a hazard they believe to be threatening the safe movement of traffic through the work zone. Flaggers may also halt operations in the event a hazard arises and the employee in charge is not in the immediate area.
 3. Equipment operators and signal persons need to know the hand signals used on the worksite.
 4. Operators and workers on foot need to know the visibility limits and the “blind spots” for each vehicle on site.
 5. Workers on foot wearing high visibility safety garments designated as class 2 or 3 as determined by the personal protection assessment or JHA.
 6. Ensure workers are aware of the ways in which shiftwork and nightwork may affect their performance.

29.2.1 Signs and Traffic Control Devices

1. Standard highway signs for information, speed limits, and work zones will assist drivers in identifying, in designated traffic paths, such directives as: *EVACUATION ROUTE*, *DO NOT ENTER*, *REDUCED SPEED AHEAD*, *ROAD CLOSED*, and *NO OUTLET*. Using standard highway signs for internal construction worksite traffic control will assist workers in recognizing the route they are to use at the construction site.
2. Standard traffic control devices, signals, and message boards will instruct drivers to follow a path away from where work is being done. The authority in charge will determine the approved traffic control devices such as cones, barrels, barricades, and delineator posts that will be used as part of the traffic control plan. These standard devices should also be used inside the work zone.



29.3 Flaggers

Because flaggers are responsible for public safety and make the greatest number of contacts with the public of all highway workers, they should be trained in safe traffic control practices and public contact techniques. Flaggers should be able to satisfactorily demonstrate the following abilities:

1. Ability to receive and communicate specific instructions clearly, firmly, and courteously
2. Ability to maneuver quickly to avoid danger from errant vehicles
3. Ability to control signaling devices (such as paddles and flags) to provide clear and positive guidance to drivers approaching a TTC zone in frequently changing situations
4. Ability to understand and apply safe traffic control practices, sometimes in stressful or emergency situations, and
5. Ability to recognize dangerous traffic situations and warn workers in sufficient time to avoid injury
6. Know the traffic flow, the work zone setup, and proper placement of channelizing devices.

In the event multiple flaggers are required, ensure they have the appropriate sight distance or two-way radios to communicate effectively.

Two flaggers: If two flaggers are used, they must coordinate their efforts. One of them must be designated as the lead flagger. The other flagger will take signals and work off the leader's paddle. The designation of lead flagger will depend on the traffic flow, lane obstruction, type of weather and topography.

Three flaggers: When three flaggers are needed, the lead flagger will be the person positioned in the middle and must be clearly visible to the other two flaggers. The lead flagger must have a good vantage point to observe traffic and control its flow. The other two flaggers must display the same side of the paddle that they see the lead flagger using.

Radio Flagging: Radio contact is one method that may be used when multiple flaggers do not have visual contact with each other. Communication can be lost if radios fail or batteries wear out. If this should happen, the flaggers must stop traffic until the problem is solved.

Employees who perform flagging or spotter activities may not be assigned other duties while performing those duties. They may not use any devices (i.e., mobile devices, headphones, etc.) that can distract their attention, vision, or hearing.

In emergency response situations (e.g., vehicular accident) where flagging operations are required and a certified flagger is not available, an employee may perform flagging duties until such time the response is not required or they are relieved by a certified flagger.



When flaggers are used, they must have the following:

1. Current flagging certification on their person while performing flagging duties at EMBARK worksites and facilities.
2. Worksite orientation/job briefing at the start of each job or whenever conditions within a job change significantly.

29.4 Personal Protective Equipment

1. Paddles and other appropriate signs approved by the **MUTCD** for use of hand signaling.
2. A means of protecting the flagger from traffic and/or equipment approaching them from behind.
3. Illumination during hours of darkness. The illumination equipment must not be positioned so that glare is visually disabling to workers, operators, or passing motorists

29.5 High Visibility Apparel

1. Flaggers shall wear a high-visibility safety garment designed according to Class 2 or 3 specifications in **ANSI/ISEA 107-2004, American National Standard for High-Visibility Safety Apparel**. This high-visibility safety garment must always be worn as an outer garment.
2. A high-visibility hard hat, appropriate for the ambient lighting at the time of the work, whose color is white, yellow, yellow-green, orange, or red.
3. Pants of any high-visibility color other than white, when snow or fog limit visibility.

29.6 Flagger Rules of Conduct

1. All employees working in the vicinity of vehicular traffic must wear PPE.
2. Flaggers should be positioned on the shoulder of the road facing the traffic. At times, it may be necessary to stand on the opposite side of the road to be effective. Never stand in the traffic lane.
3. Plan an escape route in case of an emergency.
4. Be clearly visible to approaching traffic at all times.
5. If possible, do not stand in the shade or flag from inside a vehicle.
6. Stand alone. Do not permit a group of workers to congregate around you.
7. Choose a flagging position that will maintain color contrast between you, the background, and the equipment.
8. Be alert and ready to respond to any emergency.
9. Acquaint yourself with the activities of the operation and be able to answer questions motorists may ask.



10. Record the license number and description of any vehicle and driver who disobeys your instructions and threatens the safety of the work area.
11. Establish a warning signal, such as a police whistle or shout, between the crew and flagger for an emergency.
12. Never strike a motorist's vehicle with the paddle or other device.
13. Don't involve yourself in unnecessary conversation with workers, pedestrians, or motorists.
14. Don't lean, sit, or lie on a vehicle. Be courteous and professional.
15. Don't do other work or watch the operation in addition to flagging.
16. Don't step out into, or turn your back on, the traffic.
17. Never leave your position until relieved by a qualified flagger.
18. Never leave the "Flagger Ahead" sign up when the flagger is no longer needed.
19. Rest periods that are scheduled as near as possible to the midpoint of the work period, at least 10 minutes in length. A flagger may not work more than three hours without a rest break.

29.7 Spotters

Spotters can be used to protect flaggers or other workers when it is not possible to position employees so they are not exposed to traffic or equipment approaching them from any direction. The spotter can be used to ensure that workers have adequate warning of such approaching traffic and equipment. Spotters are not to be confused with Flaggers.

1. Spotters should NEVER stand in a lane that is open to traffic.
2. When it is necessary to back a vehicle, the driver/operator must wait until the spotter communicates that it is safe to do so.
3. A spotter can be used for incidental roadwork (e.g., backing a vehicle into traffic). Use a second person as a spotter when backing with blind spots and in a congested area. A trained spotter may be used when a backup vehicle alarm is not operating.
4. The spotter must be positioned to be able to visually monitor the clearance between the job tasks and/or equipment and the potential hazards.
5. The designated spotter can be assigned other duties, provided the other duties do not interfere with the spotter's ability to give timely warning for all operations.
6. The spotter must be able to give timely warnings.
7. Spotter must wait for traffic to clear prior to directing vehicles into traffic.



29.8 Work Zones

1. Traffic control devices, signs, and barricades must be set up and used according to the current edition of the **MUTCD**, ODOT, local, and EMBARK requirements. If one document is less stringent than the other, the most stringent approach shall be followed.
2. Only those employees who have had the necessary training may set up the work zone.
3. Work Zones must be set up according to the MUTCD and associated work zone durations.
4. When placing or removing devices, all moving traffic shall be carefully observed, and extreme caution exercised to avoid an accident.
5. Set up traffic control within a reasonable time prior to construction so motorists do not become complacent and ignore warning signs and devices when work begins.
6. The work area shall be kept at a safe minimum size and all materials, tools, equipment, and functions shall be retained therein and in a clean and orderly manner.
7. Remove traffic control devices at the end of the work.
8. Ensure that all traffic control devices are operating properly and in place at all times. Missing traffic control devices create the potential for motorists to inadvertently enter the workspace or exit the highway in the wrong place.
9. Keep channelizing devices clean and properly maintained to preserve their reflective intensity and visibility.
10. Felling trees or other activities that may cause a tree or other item to be felled toward or in the roadway or on/near railroad tracks require the use of a flagger to stop all approaching pedestrians, vehicles, or rail equipment.
11. During hours of darkness, warning lights must be prominently displayed.
12. During hours of darkness or in other low light situations, illumination must be used. The illumination equipment must be positioned in such a manner that it lights the task area adequately but does not create a disabling glare for workers, vehicle operators, and passing motorists.
13. Excavated areas must be protected with barricades.

29.9 Operations Around Workers on Foot

1. Where feasible, schedule work tasks to keep workers on foot out of areas where heavy equipment is in use.
2. Workers on foot and equipment operators should use appropriate communication methods (e.g., using hand signals and maintaining visual contact) when workers on foot are required to be in the same area as equipment.



3. Equipment operators should never move equipment without making positive visual contact with any workers on foot near the equipment.

29.10 Mobile Operations

Mobile operations include work activities where workers and equipment move along the road intermittently or continuously, usually at low speeds. Wherever possible, a shadow vehicle should be used instead of a flagger.

29.11 Control Of Traffic Through Incident Areas

1. The primary functions of temporary traffic control at an incident area are to move road users safely and expeditiously through or around the incident, and to reduce the likelihood of secondary crashes. Examples include a stalled bus blocking a lane, a road user crash blocking the traveled way, a chemical/oil spill, flood, or downed power lines. Incident areas will not be considered short-duration work. Short-duration work is preplanned but requires less than 60 minutes to complete.
2. For unexpected incidents, particularly those of an emergency nature, temporary traffic control devices on hand may be used for the initial response as long as they do not themselves create unnecessary additional hazards.
3. Workers who typically respond to incidents should have at a minimum, flares, triangles, a high visibility vest, and a hardhat. Employees are required to wear the high visibility vest when providing traffic control or acting as a spotter. They should be familiar with the Flagger Rules of Conduct (listed in this document) and conduct themselves in accordance with these safety procedures.

29.12 Training

Training for Flaggers must occur every three years or whenever safety audits or job performance indicate the need, and must be taught by a certified instructor. Employees who are responsible for work zone set-up and internal traffic control plans must also have training. The curriculum used will be based on the [MUTCD](#).

1. A certificate must be awarded and documentation retained at the agency pertinent to employees' certification.
2. Work Zone set-up training must occur prior to start of the assignment and then as needed.

Quick Reference [MUTCD](#)



30.0 DEMOLITION

30.1 Scope and Purpose

This section defines minimum safety requirements for Contractor personnel performing any alteration, demolition, dismantling or renovation of existing structures, to prevent injury to employees or members of the public and eliminate property damage during such operations.

30.2 Guidance

Prior to permitting employees to start demolition operations, a Qualified Person shall perform an engineering survey to determine structural integrity and the possibility of collapse of any portion of the structure and any adjacent structure where workers may be exposed.

1. An Industrial Hygiene or other survey identifying regulated material or other hazardous materials such as gases, explosives, flammable materials, or similarly dangerous substances shall be obtained and those materials abated prior to demolition activities. The contractor shall have, in writing, evidence that such a survey has been performed.
2. The Contractor shall utilize, as a minimum, the [National Association of Demolition Contractors Engineering Survey](#). In addition, the Contractor shall submit a demolition plan and Job Hazard Analysis to the Engineer that as a minimum addresses the following:
 - a. Protection of the public in areas surrounding the demolition site.
 - b. Emergency procedures and fire protection.
 - c. Protection of the environment.
 - d. Means and methods to minimize waste and maximize salvage.
 - e. Disposal procedures.
 - f. Fall protection methods.
 - g. Hazardous Materials procedures, including Contractor Health and Safety Plan for handling contaminated/hazardous material.
 - h. Employee protection while operating heavy equipment and/or mobile equipment.
3. A copy of the survey report and of the plans and/or methods of operation shall be maintained at the job site for the duration of the demolition operation.
4. Before any demolition begins all utilities such as electric, gas, water, steam, sewer, and other service lines shall be de-energized, shut off, capped, or otherwise controlled.
5. A survey shall be performed to determine whether asbestos, hazardous materials, gases, explosives, flammable materials, or similarly dangerous



substances are present at the work site. When the presence of any such substance is apparent or suspected, testing and removal or purging shall be performed and the hazard eliminated before demolition is started. A copy of the survey shall be kept on the project.

6. Demolition of all buildings and structures shall be conducted under the supervision of a Competent Person, who will conduct field inspections as the work progresses to ensure that the demolition plan is being implemented and adhered to and to detect hazards that may have developed during the process. A daily inspection shall be documented and any deficiencies corrected immediately.
7. Prior to concrete cutting operations where energized utilities may be present, the contractor shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electrical power circuit, exposed or concealed, is so located that the performance of the work may bring a person, tool, or machine into physical or electrical contact with the electrical power circuit and marked.
8. The Contractor shall implement and follow their submitted dust control plan throughout the demolition process as required.
9. All floor and wall openings created during demolition shall be guarded and posted.
10. All protruding nails or other sharp objects shall be pulled, bent over, or rendered harmless.
11. No demolition debris shall be dumped from heights greater than 10 feet without the use of enclosed debris chutes.
12. Use of barricades, delineation, or spotters shall be used whenever debris is being dumped from any height. Delineation or barricades shall be placed at a distance far enough to prevent exposure from falling debris.
13. All stairways, passages, and ladders being used for access and egress shall be positively identified. All others shall be barricaded and closed entirely.
14. Housekeeping shall be maintained at all times. Walkways and passages shall be kept clear and defined.
15. The Contractor shall follow the Personal Protective Equipment requirements found in this manual.
16. The Contractor shall have a Fire Protection/Hot Work policy in place.
17. Additional fire protection requirements may be required when direct area suppression systems have been deactivated.

Quick Reference

29 CFR Subpart T Demolition

ANSI/ASSE A10.6-1990 and Master Specifications/Division 2 - Site Work/02 41 13 – Site Demolition



31.0 EXCAVATION

31.1 Scope and Purpose

All excavations shall be in accordance with the requirements found in [29 CFR 1926 Subpart P](#). Adequate access and egress must be provided for excavations that are 4 feet or more in depth.

31.2 Guidance

1. Establish the locations of underground and overhead utilities and services before beginning excavation. Contact utility companies and advise them prior to the start of excavation.
2. Remove or support all surface encumbrances, as necessary, to safeguard employees.
3. Employees working in trenches 4 feet deep or more will have an adequate and safe means of exit, such as ladders, steps, or ramps available at no more than 25 feet of lateral travel.
4. Employees exposed to public vehicular traffic must wear suitable garments marked with or made of reflectorized or high-visibility material.
5. Permit no employees underneath loads held by lifting or digging equipment.
6. When hazardous atmospheric conditions exist or can be reasonably expected to exist, testing and control to prevent exposure to harmful levels is required.
7. Removable steel casings and individually manned lifelines and harnesses will protect employees in bell-bottom pier holes. Follow confined-space entry procedures.
8. Employees must not work in excavations in which there is accumulated water without necessary safety precautions.
9. Additional underpinning, shoring, or bracing may be required when adjoining utility lines, foundations, walks, and footings are endangered.
10. Store spoil, equipment, and other materials that can pose a hazard by falling or rolling into excavations at least 2 feet away or use effective retaining devices.
11. Superimposed loads, like mobile equipment working close to excavation edges, require extra sheet piling, shoring, or bracing. The use of mobile equipment near excavations also requires substantial barricades or stop logs.
12. Have a competent person capable of identifying existing and predictable hazards, and with the authority to take prompt corrective action to eliminate them, on site.
13. A competent person should be able to identify soil classifications and the protective systems to use in accordance with [29 CFR 1926 Subpart P](#).



14. A competent person must make ongoing daily inspections of excavations, the adjacent areas, and protective systems, including after every rainfall or other hazard-producing occurrence.
15. Walkways are required to cross over excavations. Walkways or bridges over excavations greater than 4 feet in depth require standard guardrails.
16. Erect standard guardrailing or solid sheeting no less than 42 inches above ground level around all tunnel shafts and bore pits.
17. Barricade or cover all wells, pits, and shafts. Backfill excavations upon completion.

31.3 Requirements for Protective Systems

When employees work in trenches more than 5 feet deep, the Contractor must protect them from cave-ins by an adequate protective system. In hazardous soil, Contractor must provide an adequate protective system in trenches under 5 feet deep.

1. Determine maximum allowable slopes for soil or rock deposits in accordance with [Table B-1, Appendix A of 29 CFR 1926 Subpart P](#).
2. Have a registered professional engineer design sloping or benching for excavations greater than 20 feet deep.
3. Qualified personnel will design and install piling, sheeting, shoring, shields, and support systems. The shoring system will withstand all loads imposed upon it.
4. Ensure material and equipment used for sheeting, sheet piling, bracing, shoring, and underpinning is in good serviceable condition. Use timbers that are sound and free of defects.
5. Place members of support systems in true horizontal position, spaced vertically and secured to prevent sliding, falling, or kickouts.
6. Progress from the bottom of the trench when removing support system members. Release jacks and supports slowly.
7. Remove support systems as you backfill the trench.
8. Extend trench boxes and shields to the bottom of the trench and no less than 18 inches above the vertical part of the trench face, except in certain cases.
9. Do not allow employees in shields during their installation, removal, or relocation.
10. When portable trench boxes are stacked, provide attaching means to prevent them from separating.
11. Do not work outside of trench shields or shoring protection in unprotected trenches.



Quick Reference

29 CFR 1926 Subpart P, Excavations

29 CFR 1926.650, Scope, application and definitions

29 CFR 1926.651, Specific excavation requirements

29 CFR 1926.652, Requirements for protective system

ANSI/ASSE A10.12-1998 (r 2016) Safety Requirements for Excavations



SECTION III — MARITIME

32.0 FERRY and RIVER CRUISE SAFETY

32.1 Scope and Purpose

Contractors working in maritime environments will adhere to all OSHA and U.S. Coast Guard regulations. This section addresses minimal personnel safety procedures for working in or on Oklahoma River Cruises facilities, vessels, landings and right-of-way.

The purpose of this section is to provide minimum safety guidance for Contractor activities in a marine environment. Contractors and subcontractors performing work on Oklahoma River Cruises property or equipment shall do so following industry safe work practices and EMBARK and OMC policies. All applicable EMBARK and OMC, Contractor, Subcontractor, Federal and State regulations shall be adhered to at all times.

32.2 Guidance

1. Emergency procedures for water rescue shall be posted and workers shall be familiar with the procedures.
2. Contractors are to supply their personnel with the appropriate personal flotation device.
3. Where the danger of drowning exists, employees shall be required to wear U. S. Coast Guard approved personal flotation devices that are marked or labeled Type I PFD, Type II PFD, or Type III PFD, or a U.S. Coast Guard approved Type V PFD that is marked or labeled for use as a work vest for commercial use or for use on vessels.
4. A personal flotation device must be fastened when worn.
5. A personal flotation device must be worn:
 - a. when doing repairs and maintenance over water or on a vessel.
 - b. when loading and unloading equipment and materials from any vessel.
6. Ring Buoys - U. S. Coast Guard approved 30-inch ring buoys with at least 150 feet of 600-pound capacity line shall be readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
7. Lifesaving Boats - One or more lifesaving boats, either manually or power-operated, shall be provided and readily accessible at all times. Lifesaving boats shall be properly maintained, ready for emergency use and equipped with oars and oarlocks attached to the gunwales, boathook, anchor, ring buoy with 50 feet of 600-pound capacity line and two life preservers in accordance with Section 1602(a)(1) and (2). Oars are not required on boats that are powered by an inboard motor.
8. Where, because of swift current, lifeboats cannot be used, a line shall be stretched across the stream with tag lines or floating planks trailing in the



water at intervals not to exceed 6 feet. If this is impracticable, some other arrangement for providing effective lifelines near the water surface shall be provided.

9. The contractor shall ensure that there is in the vicinity of each barge in use at least one portable or fixed ladder which will reach from the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that the barge is in use.
EXCEPTION: Where employees are continuously protected by railings, nets, safety belts or other applicable provisions.
10. Contractor Departure, Check-In, and Return Reporting Responsibilities:
 - a. Advise Contractor Safety Representative when leaving the boat moorage of estimated time of arrival where dock work will be done.
 - b. Contact Contractor Safety Representative before going under dock. Give estimate of the time when you will be coming out from under the dock. Do not proceed without confirmation that message has been received.
 - c. Contact Contractor Safety Representative at scheduled lunch break even if work is not complete.
 - d. Contact Contractor Safety Representative when you are finished under dock. Give the following information:
 - i. Next location for under dock work or intent to return to moorage.
 - ii. Estimate time of arrival at next location or moorage.
 - e. Contact Contractor Safety Representative to notify when you have returned to moorage and are out of the water.
11. Contractor Safety Representative* Responsibilities:
 - a. Log all communications on the status board.
 - b. Ensure that contractor(s) check-in as required and advise relief Contractor Safety Representative of status of under dock work.
 - c. In case of lost communications, the Contractor Safety Representative will make appropriate contacts with the Operations Control Center and the CSO.

32.3 Water Survival

Contractors working around, over, or on the water such as on vessels or platforms, shall ensure that workers:

1. Locate the station bill and learn their emergency duties.
2. Take a tour of all areas.
3. Be familiar with all passageways and know where they lead.



4. Locate all exits.
5. Be familiar with lifejacket locations.
6. Know the emergency signals.
7. Know the location of life boats/rafts.
8. Know the location of fire alarm controls and firefighting equipment.
9. Participate in all emergency drills.
10. Report any emergency equipment not working properly.
11. Falls from vessels, structures, embankments:
 - a. Orient yourself in the water and move away from any moving equipment such as propellers.
 - b. Look for rescue equipment and listen for instructions.
 - c. Let rescuers come to you, avoid swimming long distances.

32.4 Vessels

1. All personnel will wear shoes or boots that have oil resistant non-slip soles. (No open-toed shoes (flipflops, sandals, stiletto pumps) will be worn at any time.
2. All personnel will board and egress to and from all vessels with the utmost care and awareness of their surroundings.
3. When stepping to or from a vessel, watch for any materials that may be a slip or trip hazard and may result in an unstable or unsafe movement.
4. Personnel will wear their life vest when moving from any vessel to any other vessel or dock. Employees shall not be permitted to walk along the sides of covered lighters or barges with coamings more than 5 feet high unless there is a 3-foot clear walkway or a grab or a taut handline is provided.
5. Decks and other working surfaces shall be maintained in a safe condition.
6. Employees shall not be permitted to pass fore and aft, or over, or around deck loads, nor shall employees be permitted to walk over deck loads from rail to coaming, unless there is a safe passage.
7. If it is necessary for an employee to stand at the outboard or inboard edge of the deck load where less than 36 inches of bulwark, rail, coaming, or other protection exists, the employee shall be provided with a suitable means of protection against falling from the deck load.
8. Do not run on or jump between vessels and docks.
9. Ensure that all gangways are kept clear and swept clean.
10. Keep loose gear, wires, ropes, ratchets, etc. stowed neatly.
11. Keep all hatch covers tightened down.



12. Do not stand in the bight (the loop or slack part of a rope) of a line at any time.
13. Stand clear of lines or wires when they have a strain on them. DO NOT straddle.

32.5 Under Dock Work

Contractors who work under docks must receive education in potential hazards, reporting procedures, and use of radios and life jackets. Working under a dock is considered permit confined space work.

32.6 Accident Reporting

In addition to reporting accidents to EMBARK's CSO and the contract liaison, the Contractor is required to file a boating accident report with the Oklahoma Highway Patrol, Boating Law Administrator if the vessel is involved in an accident that results in any of the following:

1. A person dies
2. A person is injured and requires medical treatment beyond first aid
3. A person disappears from the vessel under circumstances that indicate death or injury
4. Damage to vessels and other property totals \$2,000 (lower amounts in some states and territories).
5. The boat is destroyed.

32.7 Report Timelines:

1. Within 48 hours if
 - a. a person dies within 24 hours,
 - b. is injured and requires medical treatment beyond first aid, or
 - c. disappears from the vessel under circumstances that indicate death or injury.
2. Within 10 days of the occurrence or death if earlier reporting is not required.

32.8 Accident Reporting Forms

Forms may be found on the Coast Guard's Directive and Publications Division Website at <http://www.dcms.uscg.mil/Our-Organization/Assistant-Commandant-for-C4IT-CG-6/The-Office-of-Information-Management-CG-61/Forms-Management/CG-Forms/> or entering the form numbers into a web search engine.
CG-3865 Recreational Boating Accident Report

Most states and territories accept this form, although some have their own. A listing of contacts for the state's primary boating authority may be found at <https://www.nasbla.org/about-nasbla/boating-contacts>



Reports are generally sent to the Boat Accident Report Database administrator.
Please see [33 CFR 173.51 Casualty and Accident Reporting](#) for further information.

Quick Reference

[29 CFR 1915](#)

[33 CFR 173.51](#)



33.0 SECTION IV — STREETCAR TRACK ACCESS and RIGHT-OF-WAY SAFETY

The Downtown Loop (D-Loop) streetcar line connects Midtown to Downtown to Bricktown. A second line, the Bricktown Loop (B-Loop) connects Bricktown to the new Convention Center, hotel, and Scissortail Park on Oklahoma City Boulevard. There is non-revenue track approximately 0.4 miles, on Hudson connecting the Storage and Maintenance Facility to the Mainline. The Storage and Maintenance Facility is located at 406 SW 7th Street, Oklahoma City, OK 73109.

33.1 Scope and Purpose

Work in the proximity of railway track(s) is potentially hazardous where movement of streetcars and equipment can occur at any time and in any direction. All work performed by the Contractor within or adjacent to the ROW of EMBARK must be in compliance with the contract and the requirements of track access procedures.

The rules and requirements are adopted to protect EMBARK Rail operations, including the proper manner of protecting the tracks, signals, fiber optic cables, pipelines, other Right-of-Way (ROW), and tenants or licensees upon, adjacent to, across (under, and/or over), and along EMBARK (ROW) during the construction and/or maintenance activities on or adjacent to the ROW.

All railroad tracks within and adjacent to the project site are to be assumed active and streetcar traffic over these tracks must be maintained throughout the project. Streetcar traffic may include streetcars from any direction and not adhering to a fixed schedule. EMBARK operations can occur continuously throughout the day and night on these tracks and may not be interrupted except as approved by EMBARK. The Contractor shall coordinate and schedule the work so that construction activities do not interfere with rail operations.

33.2 Guidance

The Contractor, and its sub-contractors of any tier (collectively referred to as the Contractor), must coordinate its work with EMBARK during construction of the project when any of the following conditions are present:

1. Where work is performed on the Right-of-Way
2. When the work is over, under, or adjacent to the tracks
3. When excavations are performed within 10 feet of the centerline of the nearest track, or
4. When the work has the potential to foul (obstruct) any track or reduce any clearance below the allowable minimum.

The Contractor may not move, relocate, remove, obstruct, or otherwise interfere with any railroad tracks, signals, cables, signs, flags, or other railroad facilities, or any service or connection to any railroad facility unless it is within the scope and purpose of their contract with EMBARK.

The Contractor's ability to enter ROW is subject to the absolute right of EMBARK to cause the Contractor's work on ROW to cease if, in the sole opinion of EMBARK, the



Contractor's activities create a hazard to ROW, or EMBARK employees, the public, EMBARK operations, or any combination thereof.

1. The Contractor shall inform itself of the expected train movements over the tracks in the vicinity of the work prior to developing its plans for any portion of the work. The Contractor must plan, schedule, and conduct all work activities so as not to interfere with the movement of any streetcars.
2. The Contractor shall perform no work on the ROW until all its employees, including sub-contractors of any tier, have attended and passed the class. The class is provided by and shall be scheduled with the OMC.
3. The EMBARK EIC is responsible for on-track safety anytime that work is underway on or adjacent to the track.
4. Services of an EIC will be provided by the OMC using streetcar personnel trained and qualified on the ROW which they will be providing services.
5. The Contractor may not provide an EIC or perform flagging or other protective services for streetcar operations unless the OMC has provided the correct level of training and certified that employee as such.
6. No work may begin until an EIC is present at the work site and proper protection has been provided.
7. The EIC will provide job briefings and safety protection to assure the contractor a safe work environment and the safe passage of streetcars. The EIC will conduct job briefings at the start of every work shift and every change of conditions affecting roadway worker safety during a work shift.
8. The EIC has the authority to temporarily or permanently halt work or to temporarily or permanently remove employees of the Contractor from the ROW in order to assure the work is conducted safely.
9. The Contractors' employees must comply immediately with all instructions of the EIC involving work within or affecting the ROW.
10. Additional personnel may be required to protect the Streetcar facilities and operations, if deemed necessary by the OMC representative or other authorized EMBARK employee.
11. The maximum shift duration for one EIC is 10 hours. The 10 hours includes 8 hours of the Contractor work and two (2) hours to install and remove work zone signals.
12. The Contractor shall not be allowed to work within the Operating Envelope during the 2-hour work zone installation and removal. The minimum shift duration for flagging services is four (4) hours. If the Contractor desires to perform activities requiring an EIC that are longer than 10 hours' duration, then the Contractor shall coordinate with contract liaison to schedule multiple EICs for said work.
13. The Contractor shall call the phone number provided with the executed copy of EMBARK agreement, a minimum of 15 working days in advance of the



date that services of an EIC will be required. An EIC will not be scheduled until the Contractor has executed EMBARK agreement and the Contractor has attended the required safety training and track access requirements.

33.3 Right to Challenge Sufficiency on Right-of-Way Safety

1. The employees of the Contractor may, during the job briefing process, request clarification of the protection against streetcars being provided by the EIC.
2. If an employee of the Contractor does not believe that the protection against trains is sufficient, the employee may at any time, in good faith, challenge the form of protection established by the EIC and must remain clear of all tracks until the challenge is resolved.
3. The challenge must be resolved before work can begin. The challenge and resolution will be documented as a part of the job briefing process.
4. If the Contractor disagrees with any instructions from the EIC, the contractor and contractor's employees must immediately clear the work zone to a safe location.
5. After employees are clear of tracks, the contractor may contact the EIC's supervisor or EMBARK's CSO to resolve any disagreement over the instruction provided.

33.4 ROW Housekeeping

1. The Contractor must not pile or place any materials, articles, or equipment, nor park any machinery or equipment within ROW, or closer than 10-0" to the center line of the nearest track, or in a manner that blocks access to EMBARK facilities and equipment.
2. Soil, aggregates, and other similar loose materials must be covered to prevent migration of the material toward the track. Dust or blowing soil or debris must be controlled in accordance with federal, state, and local regulations.
3. Materials, machinery, and equipment must not be stored or left within 250 feet of any highway railroad grade crossings, where storage of the same will interfere with the sight distances of motorists approaching the crossing.
4. For construction on ROW the Contractor must establish a storage area with concurrence of EMBARK prior to beginning work, or as part of a site-specific work plan.
5. Machines or vehicles must not be left unattended with the engines running.
6. Parked machines and equipment must be turned off and must be in gear with brakes set. If equipped with blade, pan, or bucket, the blade, pan, or bucket must be lowered to the ground.
7. All machinery and equipment permitted to be left unattended on ROW must be left inoperable and secured against movement.



8. Do not park vehicles over vegetation that might be ignited by the heat from the vehicle's exhaust system.

33.5 General Precautions When Working Near Electrical Conductors

1. All wires and cables must be considered to carry electric current at high voltage and to be dangerous unless informed to the contrary by proper authority. When using temporary power cords, cords must never be placed over the rails, and employees must not place any metal objects across the rails.
2. For all power lines the minimum clearance between the lines and any part of the equipment or load must be as shown below:

ITEM	MINIMUM CLEARANCE
Electric Wires equal to or greater than 650 volts.	10'0"
Electric wires carrying less than 200 KV	15' 0"
Electric wires carrying 2000 KV to 350 KV	20'-0"
Electric wires carrying 350 KV to 500 KV	25'-0"
Electric wires carrying 500 KV to 750 KV	35'-0"
Electric wires carrying 750 KV to 1000 KV	40'-0"

If OSHA, NFPA, NEC and/or the utility owner's clearance requirements are more restrictive than those shown herein, the most restrictive clearances shall apply.

3. If capacity of the line is not known, a minimum clearance of 45 feet must be maintained.
4. A person must be designated to observe clearance of the equipment and give a timely warning for all operations where it is difficult for an operator to maintain the desired clearance by visual means. When the height of overhead wire lines cannot be determined from the available records, the actual height must be determined by field survey.
5. All damage to the ROW, facilities, or property of EMBARK, or any accident or incident within EMBARK ROW, or any hazard identified on passing trains must be reported immediately to the EIC or the OCC.
6. Any vehicle or machine which comes in contact with the track, signal equipment, structure, or other railroad installation or facility, regardless of the force of the impact, may result in the derailment of a streetcar and must be reported immediately to OCC.

33.6 ROW Worker Safety

When on or near the tracks, the following precautions must be taken:

1. Keep clear of all tracks unless the EIC has provided a job briefing and identified the On-Track Safety protection in effect. No work may begin until the EIC is present at work site and a job briefing has been conducted.



2. Always look both ways before crossing tracks. Always step over the rails when crossing the tracks. Never walk, stand, or sit on the rails. The rail surface can be extremely slippery.
3. Always face the direction from which the train or on-track equipment is approaching.
4. Avoid track switches. The switch points are controlled from a remote location, can move unexpectedly, and exert enough force to crush ballast rock. Stand 150 feet from track switches when trains are approaching. Stay away from any other railroad device with which you are not familiar.
5. Always walk single file when crossing the tracks in a group.
6. Never stand between adjacent tracks in multiple track territory when a streetcar is passing.
7. Always cross at least 20 feet away from the end of equipment: e.g., either end of streetcars or on-track equipment.
8. Do not pass between standing streetcars or on-track equipment when there is less than 50 feet between the equipment.
9. Never cross tracks by going underneath, over, between or through cars or on-track equipment.
10. Never stand or walk between the rails. Always walk on the outside of the rails facing the direction of opposing traffic.
11. Always stop equipment while a streetcar is passing through your working limits. No movement will be allowed toward an approaching streetcar that would cause the operator to believe the track might be fouled.
12. Streetcars travel faster than they appear and are relatively quiet. Streetcars may operate with either cab end forward. You should not rely on past experiences to determine streetcar schedules. Streetcar schedules are unpredictable and are subject to changes and/or delays.
13. Always expect a streetcar on any track at any time. Trains may stop, reverse direction, set out cars, or run around stopped trains without notice.
14. Expect movement of streetcars or on-track equipment on any track in either direction at any time.

33.7 Contractor Rules on the Right-Of-Way (ROW)

The following rules must be followed at all times:

1. Work on public streets, roadway crossings, and highway bridges must conform to the Oklahoma Vehicle Code and the standards given in the [Manual of Uniform Traffic Control Devices \(MUTCD\)](#) and must be performed with due regard for the convenience and safety of the public.
2. All Track Access-trained personnel must abide by the [SC-SOP-200.01 Track Access SOP](#) and have a current Certification Card in their



possession at all times, while working on or about the streetcar system and/or within the streetcar envelope.

3. Any employees, agents, or invitees of Contractor or its sub-contractors under suspicion of being under the influence of drugs or alcohol, or in the possession of same, will be removed from the ROW and subsequently released to the custody of a representative of the Contractor's management. An employee removed for violation of the drug or alcohol policy will not be permitted future access to the ROW.
4. Horseplay, physical altercations, running, and jumping is prohibited.
5. Firearms and other deadly weapons, including knives, are prohibited.
6. Only authorized employees are allowed on streetcars, or other rail equipment.
7. Contractor employees must exercise care to prevent injury to themselves and others.
8. Employees must be always alert and attentive when performing their work.
9. Any defective tools, machinery, and equipment are prohibited from use on ROW and, if found, must be removed immediately.

33.8 Accident Reporting

For EMBARK Streetcar Accidents

33.8.1 ACCIDENTS

ACCIDENTS
Criteria for ODOT-Reportable Accidents
A loss of life. Loss of life means a fatality at the scene or within 30 days following the accident.
A report of serious injury to a person. Serious injury means any injury which: <ol style="list-style-type: none"> (1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received, (2) Results in a fracture of any bone (except simple fractures of fingers, toes, or nose), (3) Causes severe hemorrhages, nerve, muscle, or tendon damage, (4) Involves any internal organ, or (5) Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.
Property damage resulting from:* <ul style="list-style-type: none"> • A collision involving a rail transit vehicle or • Any derailment of a rail transit vehicle.
A collision involving a rail transit vehicle
A runaway train
An evacuation for life safety reasons
Any derailment of a rail transit vehicle, at any location, at any time, whatever the cause**
Any fire or smoke condition, at any location, at any time, whatever the cause***
Examples of Accidents



A collision between a rail transit vehicle and another rail transit vehicle
A collision at rail grade crossing resulting in serious injury or fatality
A collision with a person resulting in serious injury or fatality
A collision with an object resulting in a serious injury or fatality
A derailment in the mainline or yard
An evacuation of a train or station for life safety reasons such as fire / smoke condition, bomb threat, or suspicious package
An OKC Streetcar evacuation or passenger self-evacuation of a train on to the wayside
A criminal act such as murder and non-negligent homicide, rape, robbery, aggravated assault, burglary, motor vehicle theft, larceny-theft, and arson that results in the loss of life or serious injury
Required Actions for All Accidents
EMBARCK to notify ODOT and FTA within 2 hours of the event
EMBARCK to provide NTD report to ODOT within 30 days as supporting document with the accident investigation status report or final report.

33.8.2 Incidents

INCIDENTS
Criteria for ODOT-Reportable Incidents
A personal injury that is not a serious injury.
One or more injuries requiring medical transportation away from the event
Non-collision related damage to equipment, rolling stock, or infrastructure that disrupts the operations of the OKC Streetcar
Examples of Incidents
A hard start / stop of a rail transit vehicle that results in a passenger that requires transport away from the scene.
A criminal act that results in bruises, scrapes and scratches such as an assault on a person on a rail transit vehicle or rail station platform.
Vandalism of rail transit vehicle (e.g., broken window, offensive graffiti) that requires removal of the vehicle from revenue service.
Evacuation of a train into the ROW or onto adjacent track, including self-evacuations, for reasons other than life safety reasons
Collisions involving a rail transit vehicle not falling within the accident reporting requirements of Table 10-3 .
Required Actions for All Incidents
OKC Streetcar to report to FTA within 30 days via the NTD
OKC Streetcar to record in the monthly Accident Tracking Log for causation and trend analysis (SMS)

33.8.3 Occurrences

OCCURRENCES
Criteria for ODOT-Reportable Occurrences
No personal injury



Non-collision related damage to equipment, rolling stock, or infrastructure that does not disrupt the operations of OKC Streetcar
Examples of Occurrences
Close calls / Near Misses
Safety policy and rule violations
Red signal overruns.
Broken crossing gate.
Vandalism of rail transit vehicle (e.g., broken window, offensive graffiti) that does not require removal of the vehicle from revenue service.



34.0 SECTION V — BUS OPERATIONS

34.1 Scope and Purpose

The Chief of Bus Operations serves as the first point of contact at EMBARK for public or private contractors, including city, state or other government agencies planning construction projects that may impact EMBARK services or properties.

EMBARC requires construction notification and offers these guidelines for construction activities that have the potential for impacting EMBARK Bus, Streetcar, or Ferry Operations including streetcar overhead outage requests, special events that would impact EMBARK, or any event impacting transit routes, bus stops, facilities, or properties.

34.2 Guidance

EMBARC requires the Contractor to email us prior to your event for information about how the project may impact transit operations. This allows us to best advise you on your submittal for street use permits and/or special event permits and our requirements.

Event Description	Minimum Advanced Notice
<u>Street closures or transit detours</u> to accommodate construction.	10 business days
<u>Short term bus stop moves</u> that impacts our facilities or might require a shelter move.	5 business days
<u>Long term Bus stop moves</u> that impacts our facilities or might require a shelter move.	30 business days
<u>Phase changes and re-starts</u> of existing projects.	10 business days
<u>Deactivation of streetcar overhead wire or streetcar track ROW access</u> (during non-revenue hours)	15 business days
<u>Streetcar overhead wire modification requests</u> (subject to design approval and infrastructure inspection and acceptance)	20 business days

You will receive written notification after your project is approved.

34.3 Transit Yard Traffic Control

Transit yards, by the nature of the business, have a significant volume of vehicular traffic. All employees, whether operating a vehicle or walking, must exercise care when navigating the yard.

1. Workers must follow the traffic patterns and posted speed limits when driving in a base yard.



2. Workers operating vehicles must be vigilant for pedestrians.
3. Workers who must work around moving coaches and other moving vehicles shall wear a high visibility garment.
4. Pedestrians navigating the yard must stay on walkways as much as feasible.
5. Everyone must be vigilant for vehicular traffic.
6. Operations on the Grid:
 - a. Do not exceed 5 mph anywhere on the Grid.
 - b. Check mirrors on both sides frequently,
 - c. Obey all signs, come to a complete stop at all stop signs,
 - d. Yield to pedestrians
 - e. Yield to any vehicle backing up,
 - f. Enter and exit the Grid and Shop only at the appropriately marked entrances and exits,
 - g. Look in all directions before exiting a vehicle or walking between vehicles,
 - h. High visibility vests are required when walking on the Grid,
 - i. Do not use any mobile devices while walking on the Grid. Pedestrians needing to communicate should do so after stopping and securing themselves in a safe place (while stopped on a sidewalk path or inside a vehicle) until their communication is completed.
 - j. Personal vehicles are not allowed on the Grid.



SECTION VI — REFERENCES

35.0 REFERENCES

OSHA (Occupational Safety and Health Administration)

1. 29CFR 1903 Inspections, Citations, and Proposed Penalties
2. 29CFR 1904 Recording and Reporting Occupational Injuries and Illness
3. 29CFR 1910 Occupational Safety and Health Standards — General Industry
4. 29CFR 1915 Occupational Safety and Health Standards for Shipyard Employment
5. 29CFR 1926 Safety and Health Regulations for Construction
6. OSHA Fact Sheet, Work Zone Traffic Safety

ANSI (American National Standards Institute)

1. ANSI/ASME B30.5 Cranes and Hoists
2. ANSI/ISEA [1999]. American National Standard for High-Visibility Safety Apparel. ANSI/ISEA 107-2020 High Visibility Safety Apparel
3. ANSI/ISEA Z87.1-2015 Occupational and Educational Personal Eye and Face Devices
4. ANSI/ISEA Z89.1-2014 American National Standard for Head Protection

NFPA (National Fire Protection Association)

1. National Fire Protection Association Standard 10 Standard for Portable Fire Extinguishers
2. EMBARK Public Transit Agency Safety Plan
3. ODOT Program Standard

EMBARK SOPs

1. EM-SOP-100.16 Mobile Device SOP
2. SA-PLN-602.00 COTPA Emergency Action Plan
3. SA-SAP-300.12 Hazardous Material Spill
4. SA-SAP-600.06 Hazard and Security Risk Identification
5. SA-SAP-600.11 Hazard Communication
6. SA-SAP-600.18 Personal Protective Equipment
7. SA-SAP-600.20 Bloodborne Pathogens
8. SA-SAP-603.00 Safe Work Methods



9. SA-SAP-609.00 First Aid
10. SA-SAP-614.00 Job Hazard Analysis
11. SA-SAP-615.00 Respiratory Protection
12. SA-SAP-615.01 Hearing Protection
13. VM-SMP-500.02 Lockout Tagout
14. VM-SMP-500.06 Calibration of Equipment
15. VM-SMP-500.19 Hot Work Safety Procedures
16. VM-SMP-505.00 Yard and Shop Maneuvering
17. VM-SMP-513.00 Fall Protection
18. VM-SMP-513.01 Scissor Lift
19. VM-SMP-514.00 Maneuvering in the Pit Area
20. VM-SMP-520.00 Forklifts
21. VM-SMP-521.00 Risk Assessment

Other

1. Building Safer Highway Work Zones: Measures to Prevent Worker Injuries from Vehicles and Equipment DHHS/NIOSH Pub. No. 2001-128
2. Manual on Uniform Traffic Control Devices, 2009 w/ Rev #'s 1 and 2, effective June 2012 Edition., U.S. DOT, Federal Highway Administration



36.0 APPENDICES

Appendix A: Track Access & Contact System Deactivation Request Form

OKLAHOMA CITY STREETCAR		Oklahoma City Streetcar Track Access & Contact System Deactivation Request	
Work within ten feet of the Overhead Contact System requires line deactivation			
MINIMUM FOURTEEN (14) DAYS NOTIFICATION			
REQUIRED INFORMATION			
Company Name			
Applicant Name and e-mail address		Office Phone	Mobile Phone Fax (if unable to provide e-mail)
Deactivation Date(s): (mm/dd/yy)		Mon-Thur Start (from 12:45 AM each night)	Tue-Fri End (until 5:00 AM each morning)
until		: _m	: _m
Post-Fri service Start (from 2:45 AM Sat)		Pre-Sat service End (until 6:00 AM Sat)	Post-Sat service Start (from 2:45 AM Sun)
: _m		: _m	: _m
Pre-Sun service End		Sun Start	Mon End (until 5:00 AM)
: _m		: _m	: _m
Location of Work (Include Address or Affected Street with Proximity in Measured Feet to Nearest Cross Street)			Street Use Permit No.
Primary Contact Person (Project Manager or Crew Lead, On-Site preferred)		Mobile Phone 24/7	
Alternate Contact Person (On-Site Lead Foreman or Second-in-Command)		Mobile Phone 24/7	
Track Access No. (if applicable)	Applicant confirmation Signature		
SUPPLEMENTAL INFORMATION			
Description of work.			
▼ Include description in space below – specify if line segment removal is required ▼			
Nature of Work			
Will work require general-purpose traffic to be detoured?		(Check one)▶	<input type="checkbox"/> YES <input type="checkbox"/> NO
▼ If "YES" continue below ▼			
Traffic Control Plan (Brief Description of Official Detour Route, UPO posts)			
Will work affect Streetcar Station Stops?		(Check one)▶	<input type="checkbox"/> YES <input type="checkbox"/> NO
▼ If "YES" continue below ▼			
Location of station stop(s) and how affected			
Will work be performed during non-revenue service times (See chart below)		(Check one)▶	<input type="checkbox"/> YES <input type="checkbox"/> NO
▼ If "NO" continue below ▼			
Explanation			
Deactivation Request		(Check one)▶	<input type="checkbox"/> YES <input type="checkbox"/> NO
Will equipment/personnel enter the Streetcar envelope or be below track slab?		(Check one)▶	<input type="checkbox"/> YES <input type="checkbox"/> NO
▼ If "YES" continue below ▼			
Type of equipment used and estimated frequency & duration for it and workers being inside the envelope or underneath the slab			
Will equipment/personnel continuously need to be inside the Streetcar envelope?		(Check one)▶	<input type="checkbox"/> YES <input type="checkbox"/> NO
▼ If "YES" see below ▼			
Continuous work within the Streetcar envelope is only allowed during non-revenue hours			
Will any equipment/personnel come to within or may come within ten feet of the OCS? *Overhead Contact System (High Voltage Line)		(Check one)▶	<input type="checkbox"/> YES <input type="checkbox"/> NO
▼ If "YES" see below ▼			
Work within 10' of the OCS requires deactivation			
If work requires continuous access to the Streetcar envelope or an OCS outage, will more time be needed beyond non-revenue hours		(Check one)▶	<input type="checkbox"/> YES <input type="checkbox"/> NO
CONFIRMATION OF REQUEST			
FOR DPW/OFFICE OF TRANSPORTATION /STREETCAR OPERATIONS ONLY			FORM NO.
Request approved?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If "NO" then explanation for denial ▶	
Maintenance approved?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Manager:	Date:
Safety/Security approved?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Manager:	Date:
Request rescinded by DPW or cancelled by submitter?		<input type="checkbox"/> Yes	
▼ If "YES" then reason for rescinding or cancelling ▼			
GENERAL MANAGER NAME	DATE RECEIVED	DATE APPROVED/REJECTED	
		<input type="checkbox"/> Approved <input type="checkbox"/> Rejected	
Oklahoma Streetcar		Doc. Control Rev. 08/03/2017	



Appendix A: Track Access & Contact System Deactivation Request Form (Cont.)


OKLAHOMA CITY STREETCAR  *Oklahoma City Streetcar Track Access & Contact System Deactivation Request*

REFERENCE CHART FOR NIGHTLY ALLOWABLE RANGE OF A STREETCAR OCS OUTAGE			
DAY OF OPERATION	STREETCAR HOURS	PRE-OP & POST OP BUFFER	RANGE ALLOWED FOR OCS OUTAGE
MONDAY	5:45 AM <u>until</u> 12:00 AM	5:00 AM to 5:45 AM and 12:00 AM to 12:45 AM	12:45 AM Tue – 5:00 AM Tue
TUESDAY	5:45 AM <u>until</u> 12:00 AM	5:00 AM to 5:45 AM and 12:00 AM to 12:45 AM	12:45 AM Wed – 5:00 AM Wed
WEDNESDAY	5:45 AM <u>until</u> 12:00 AM	5:00 AM to 5:45 AM and 12:00 AM to 12:45 AM	12:45 AM Thu – 5:00 AM Thu
THURSDAY	5:45 AM <u>until</u> 11:00 AM	5:00 AM to 5:45 AM and 12:00 AM to 12:45 AM	12:45 AM Fri – 5:00 AM Fri
FRIDAY	5:45 AM <u>until</u> 2:00 AM	5:00 AM to 5:45 AM and 2:00 AM to 2:45 AM	2:45 AM Sat – 6:00 AM Sat
SATURDAY	6:45 AM <u>until</u> 2:00 AM	6:00 AM to 6:45 AM and 2:00 AM to 2:45 AM	2:45 AM Sun – 5:00 AM Mon
SUNDAY		<i>Varies per event & Maintenance Schedule</i>	

* May not pertain to all holidays.



Appendix B: Track Access Notification Form



		Track Access Notification Form Track Access Permit Number _____					
Date of submission:	_____	Type of access	<input type="checkbox"/> Emergency <input type="checkbox"/> Track Access <input type="checkbox"/> Event				
Date of access	_____						
Permit holder	_____						
Description of Work:	_____						

Number of Workers:	_____	Hours of access	<table border="1" style="display: inline-table;"> <tr> <th>From</th> <th>To</th> </tr> <tr> <td> </td> <td> </td> </tr> </table>	From	To		
From	To						
Limit of access	Street intersection						
	From: _____		To: _____				
	Street						
	From: _____		To: _____				
Trained Permittee field worker(s) Certified by Streetcar Operator	<input type="checkbox"/> Yes	<input type="checkbox"/> No					
Power Down; Removal During Non-Revenue Service Hours Requested:	<input type="checkbox"/> Yes	<input type="checkbox"/> No					
Power Down; Removal During Revenue Service Hours Requested:	<input type="checkbox"/> Yes	<input type="checkbox"/> No					
Flagger Required	<input type="checkbox"/> Yes	<input type="checkbox"/> No					
Personal Protective Equipment							
Attachment Enclosed:	_____						
Special Operating Conditions:							
	1. Work within 10 feet of the Overhead Contact System requires line deactivation; any continuous work within its Envelope of Operation requires shutdown of service. Efforts must be made to schedule such work during non-operational hours unless due to emergency or major coordinated work.						
	2. Request for Right-of-Way access permit must be submitted by 12:00 p.m. (daily), 48 hours prior to the scheduled work.						
	3. All personnel must wear reflective safety garments conforming to 1988 Edition, MUTCD Sec. 6E-3, High-Visibility Clothing.						
	4. Job briefing must be performed before start of job.						

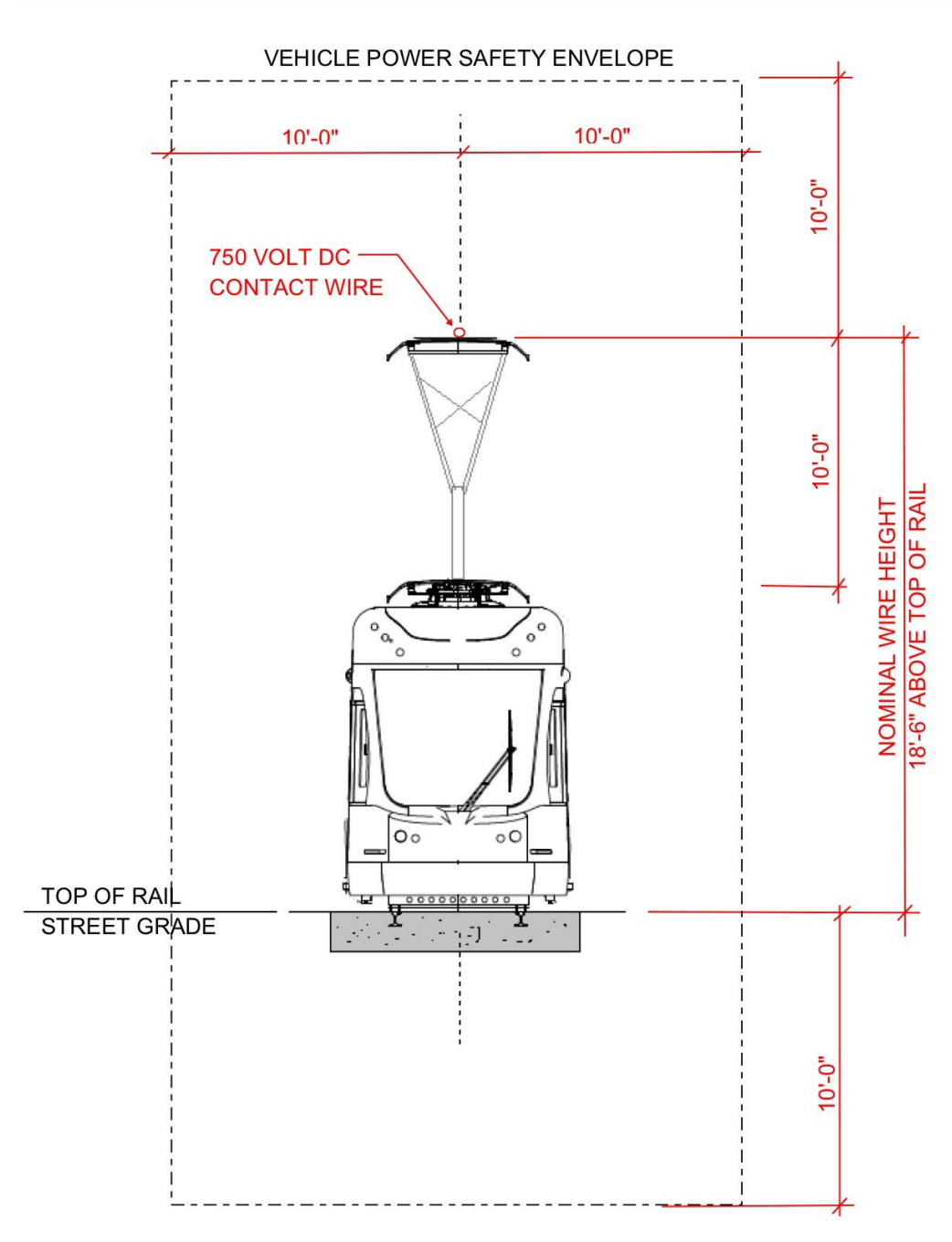


Appendix C: Track Access Certification Card

Track Access Certification Card

	Oklahoma Streetcar Track Access Certification Card 406 SW 7th street Oklahoma City, OK
[First Name] [LAST NAME]	OKLAHOMA CITY STREETCAR 
ID # _____	Signature _____
Expiration: _____	

Appendix D: Streetcar Envelope Diagram



Appendix E: OSHA Construction Industry Training Requirements

Training Requirements	OSHA Reference	Certification Required?	Minimum Training Frequency
Accident Prevention: Qualified Operators	CFR-1926.20 (b) (4)		
Safety Training and Requirements.	CFR-1926.21 (b)		
Access to Employee Exposure & Medical Records	CFR-1910.1020(b)(3)		Upon employment, annually thereafter
Employee Emergency Action Plans	CFR-1926.35(e)		Upon development of plan, then when responsibilities or plan changes
First Aid/CPR	CFR-1926.50(c)	yes	Consistent with First Aid/CPR program requirements
Ionizing Radiation	CFR-1926.53		
Non-ionizing Radiation	CFR-1926.54 (a) & (b)	yes	
Ventilation: Open Surface Tanks	CFR-1926.57(i)(9) (i)		
Hazard Communication	CFR-1910.1200		At the time of initial assignment, then whenever new hazards are introduced
Lead	CFR-1926.62		Prior to initial assignment, then annually (for employees exposed at or above the action level)
Process Safety Management of Highly Hazardous Chemicals	CFR-1926.64(g) & (h)	yes	Upon initial assignment, then every 3 years
Hazardous Waste Operations & Emergency Response	CFR-1926.65(b)(1)(iv)	yes	Upon initial assignment, annually thereafter
Respiratory Protection	CFR-1910.134		Prior to use and then at least annually
Fire Protection: Fire Brigades	CFR-1926.150 (a)(5)		
Powder Actuated Tools	CFR-1926.302 (e) (1)	yes	
Welding: Fuel Gas	CFR-1926.350 (d)		
Welding: Arc Welding and Cutting	CFR-1926.351 (d)		
Welding: Fire Watch	CFR-1926.352 (e)		
Scaffolding: Aerial lifts	CFR-1926.453 (b)(2)(ii)		
Scaffolding: Employees Working on Scaffolding	CFR-1926.454 (a), (c)	yes	Upon initial assignment, then when equipment changes and as needed to maintain proficiency
Scaffolding: Erection Crews	CFR-1926.454 (b), (c)	yes	Upon initial assignment, then when equipment changes and as needed to maintain proficiency



Training Requirements	OSHA Reference	Certification Required?	Minimum Training Frequency
Fall Protection	CFR-1926.503	yes	Upon initial assignment, then when equipment changes and as needed to maintain proficiency
Powered Industrial Trucks (Forklifts)	CFR-1926.602 (d)	yes	Prior to use, then at least every 3 years, or after accident or near miss, or unsafe operation or different type of truck
Steel Erection*	CFR-1926.761		
Underground Construction	CFR-1926.800(d), (g)(5)(iii & v)		Annually
Power Transmission and Distribution: Emergency Procedures	CFR-1926.950 (e)		
Stairways & Ladders	CFR-1926.1060		Prior to use, thereafter sufficient to maintain understanding & knowledge
Asbestos	CFR-1926.1101		Upon initial assignment, annually thereafter
Benzene	CFR-1910.1028		Upon initial assignment, annually thereafter
General Industry Standards:			
Permit Required Confined Spaces	CFR-1910.146	yes	Prior to use, thereafter when change in duty or deviation from procedures occurs, and with sufficient frequency to maintain understanding & knowledge
Lock-out/Tag-out of Hazardous Energy	CFR-1910.147(c)(7)	yes	Upon initial assignment, with changes in job assignment or new hazards are introduced for authorized & affected employees, and sufficient frequency to maintain understanding & knowledge thereafter
Portable Fire Extinguishers	CFR-1910.157(g)		Upon initial assignment, annually thereafter
Employee Alarm Systems	CFR-1910.165(b)(4)		
Bloodborne Pathogens	CFR-1910.1030(g)(2)		Upon initial assignment, annually thereafter



Construction Industry Competent Person Requirements OSHA 1926

Competent Person Requirements	OSHA Reference	Name of Competent Person	Verification Required
Accident Prevention	CFR-1926.20 (b) (2)		
Ionizing Radiation	CFR-1926.53 (b)		
Gases, Vapors, Fumes, Dust, and Mists	CFR-1926.55 (b)		
Hearing Protection	CFR-1926.101 (b)		
Rigging Equipment	CFR-1926.251 (a)(6)		
Welding: Preservative Coatings	CFR-1926.354 (a)		
Assured Grounding Program	CFR-1926.404(b)(1)(iii)(B)		
Scaffolding	CFR-1926.451 (b)(10&11), (d) 10&18),(e)(9)(i), (f)(3,7,12), (g)(2)		
Fall Protection	CFR-1926.502 (c)(4)(ii), (d)(19), (h)(1)(i), (k)(4) and .503(a)(2)		
Cranes and Derricks	CFR-1926.1501		
Excavations	CFR-1926.651 (c)(1)(i), (h)(2-3), (k)(1); .652(a)(1)(ii), (d)(3)		
Steel Erection	CFR-1926.753(c)(1,2), .754(d)(1), .755(a)(4), .756(a)(2), .757(a)(2,4), .761(a)		
Underground Construction	CFR-1926.803		
Demolition	CFR-1926.850(a), .852(c), .859(g)		
Asbestos	CFR-1926-1101		
General Industry Standards:			
Slings	CFR-1910.184(d), (e)(3)(i-iii)		