1. Welcome to Lauren Engineers and Constructors

Congratulations! You are now a part of one of the most dynamic service organizations in the country with a long history of engineering, construction, and maintenance expertise. Lauren people make the company what it is today and what it will become in the future. **Together,** we are building a better future – for our clients, for Lauren, and for ourselves.

Your success in your job is very important to the operation of your project and the entire company. You will find a strong emphasis on safety in this handbook and on the job. The safety of Lauren people is ***the*** most important element of every project...this cannot be overemphasized! Read and observe the information presented in this handbook, and ***welcome to the team!***

2. Management Policy Statement

It is the policy of Lauren Engineers and Constructors, Inc, that accident prevention shall be considered of primary importance in all phases of our operation and administration. It is the intention of Lauren Engineers and Constructors, Inc.'s management to provide safe and healthy working conditions and to establish and insist upon safe practices at all times by all employees.

The prevention of accidents is an objective affecting all levels of our company and its operations. It is, therefore, a basic requirement that each supervisor make the safety of all employees an integral part of his or her regular management function. It is equally the duty of each employee to accept and follow established safety regulations and procedures.

Every effort will be made to provide adequate training to employees. However, if an employee is ever in doubt about how to do a task safely, it is his or her duty to ask a qualified person for assistance. Employees are expected to assist management in accident prevention activities. Unsafe conditions must be reported immediately. Fellow employees that need help should be assisted. Everyone is responsible for the housekeeping duties that pertain to their jobs. Every injury that occurs on the job, even a slight
cut or strain, must be reported to the project supervisor and/or the project safety representative as soon as possible. Under no circumstances, except in emergency trips to the hospital, should an employee leave the work site without reporting an injury. When you have an accident, everyone is hurt. Please work safely. Safety is everyone's business.

C. Cleve Whitener, President

3. Safety Policy

Your personal safety is a matter of great importance to Lauren Engineers & Constructors, Inc. State and federal laws, along with company policy give us rules to follow in doing each job we have, rules that are **designed to help ensure your safety**. There is no task or job so urgent that it requires you to work in a manner that is unsafe, or that endangers the public.

The rules in this handbook have been drawn from the US Occupational Health & Safety regulations, LEC's Safety and Accident Prevention Manual, and accepted industry practices. These rules are designed to help you do your job safely and efficiently. When there are conflicts between Lauren policy and the law, the more stringent requirement will govern.

The most important safety resource this company has is **you**. When you see a condition that is unsafe or you detect a hazard, you are *encouraged and required* to bring the matter to your supervisor's attention. In some instances you may be required, and you are hereby authorized, to correct serious safety problems when you see them. Employees will not be disciplined or suffer retaliation for reporting safety violations. Each Lauren employee is a member of the safety team, ***you can make a difference***.

Detailed practices are spelled out in this handbook and you are required as a condition of employment to follow them. Our goal is **ZERO** accidents and injuries. Our safety and health program will therefore include:

1. Providing mechanical and physical safeguards to the maximum extent possible

2. Conducting a program of safety and health inspections to find and eliminate unsafe working conditions or practices and to control health hazards.

3. Training all employees in good safety and health practices.

4. Providing necessary personal protective equipment and instruction for its use and care.

5. Developing and enforcing safety and health rules, stressing that employee participation is encouraged but cooperation is a condition of employment.

6. Prompt and thorough investigation of every accident, with preventing reoccurrence as a primary motivation.

4. Employee Responsibilities

As safety team members, employees share with the employer the responsibility for safety and health. Not only is this a condition of employment, it is required by law under the **Occupational Safety and Health Act**. **<u>You</u>** are responsible for your own safety, the safety of your fellow workers and the general public. You must become familiar with **and use** all the protective devices provided for your protection. Your responsibilities include, but are not limited to:

1. Constantly observing working conditions, equipment, and tools for the purpose of preventing accidents.

2. Complying with all job safety instructions.

3. Using all safety equipment required to perform the job safely.

4. Correcting unsafe acts or conditions within the scope of your work assignment.

5. Immediately advising supervisors of faulty tools, equipment or unsafe conditions.

6. Stopping work if conditions are such that there is immediate danger to life, limb, or property.

7. Immediately reporting all accidents, injuries or illnesses, and “near-miss” incidents to supervision.

THINK SAFETY
WORK SAFELY

5. General Work and Safety Rules

General Work Rules

The following is a list of items that will not be tolerated and will be grounds for immediate termination:

- Theft or attempted theft of property belonging to the Company, Owner/Client, or another employee.
- Recurrent tardiness.
- Poor and/or irregular attendance.
- Reporting to work in an intoxicated condition.
- Possession, use, or being under the influence of intoxicants while on company premises.
- Possession, use, or being under the influence of narcotics or other non-prescription drugs on company premises.
- Possession of a deadly weapon while on company premises.
- Smoking in non-designated areas.
- Fighting, horseplay and practical jokes.
- Gambling.
- Insubordination.
- Sleeping and/or loafing on the job.
- Leaving the work place or company premises without prior authorization from a supervisor.
- Picking up or leaving brass belonging to another employee.

- Dishonesty or fraud involving the company.
- Negligently damaging company materials, tools and/or equipment.
- Refusing to accept work assignments.
- Failure to use, wear or maintain safety equipment.
- Failure to observe safety, sanitary and/or medical rules and practices.
- Willful violation of any project secrecy or confidentiality agreement.
- Failing a drug or alcohol screening test.

Safety Rules

The following safety items are an integral part of the project and must be observed by employees at all times:

- Obey all safety rules and regulations required by the Occupational Safety and Health Administration (OSHA) and as posted.
- Personal protective equipment, including hard hats and safety glasses, shall be worn at all times. If the project does not require steel-toed shoes, sturdy leather work boots shall be worn. Tennis shoes and/or rubber boots will not be allowed. Hard hats are the property of the company and shall not be defaced. They will be worn as designed, bill forward.
- Double eye protection, goggles or safety glasses in addition to a full-face shield or welding hood will be worn when tasks involve increased eye hazards, such as chipping, grinding and welding.
- Fall protection is required when your working/walking surface has an unprotected side, or edge, which is 6 feet or more above a lower level. Review job-specific fall rescue plans with your supervisor.
- Hand rails and fall protection devices that are removed for a specific operation must be replaced immediately following completion of the operation.
- Report any unsafe condition to your supervisor immediately.
- All injuries, no matter how slight, must be reported immediately to your supervisor or the construction office.
- All company and personal tools shall be maintained in good and safe working condition at all times.
- Equipment on the jobsite will be operated in a safe and professional manner at all times.
- All rope, nylon and wire slings will be inspected prior to use. Defective equipment shall be repaired or destroyed.
- Employees shall never use damaged or defective extension cords.
- Employees will strictly adhere to the Company's "Confined Space/Vessel Entry Procedure."
- Employees will strictly adhere to the Company's "Lockout/Tagout Procedure."
- Whenever possible, welders will use flash screens to reduce eye hazards to nearby personnel.
- Employees shall never use gasoline, solvents or cleaners/thinners in areas where the danger of open flame or sparks exists.
- Before entering trenches or other excavated areas, the employee shall review the shoring and sloping provisions with his/her immediate supervisor.
- Butane lighters will not be allowed on company premises.
- Observe and obey warning signs.
- Fire protection equipment shall only be used for fire fighting.
- First aid equipment shall only be used for first aid.
- Safety standards of the Owner/Client and/or Prime Contractor are to be followed at all times.
- Employees will not be on the job site during off duty hours.

Violation of any of the foregoing can be grounds for disciplinary action, up to and including termination.

6. Drugs, Alcohol and Contraband

The Company prohibits all Lauren employees, employees of other contractors, companies, and other visitors to use, possess, conceal, transport, promote or sell the following items or substances:

- Illegal drugs, controlled substances (including trace amounts), look-alike, and designer drugs.
- Unauthorized alcoholic beverages.
- Firearms, weapons, explosives, and ammunition.
- Unauthorized prescription drugs.

Pre-employment Testing: All employment offers are contingent on the successful completion and passing (negative) results from a pre-employment test, which includes, but is not limited to, the rapid-eye test, physical test,

papillary reaction test, balance test, and drug/alcohol testing using bodily fluid specimens (such as urine, blood saliva, or hair) or breathalyzer testing.
Random Testing: The Company reserves the right to conduct unannounced substance abuse testing to assure the maintenance of a drug-free work place. Other reasons of substance abuse testing during the course of employment may include, but are not limited to:

- Annual employee examinations or compliance with contractual agreement with other contractors or clients.
- When an employee's supervisor has a reasonable suspicion that an employee is intoxicated, using, or under the influence of drugs or alcohol.
- When an employee is found in possession of suspected illicit or unauthorized drug and/or alcohol, or when any of these items are found in an area controlled or used exclusively by designated employees.
- Following a serious accident or incident in which safety precautions may have been violated or careless acts were performed.

Violations: Violation of this policy may result in disciplinary action up to and including termination of employment. The Company further reserves the right to immediately terminate any employee or rescind any offer of employment to a candidate who is found to have tampered with or falsified a test sample.

7. General Construction Practices

a. PPE

Personal Protective Equipment, or PPE, is designed to protect you from health and safety hazards that cannot practically be removed from your work environment through engineering or administrative procedures.

Head Protection (Hard Hats)

Hard hats are mandatory at all times on the project work area. Regular inspection of the shell and the suspension are necessary to ensure both are in good condition. Approved hard hats are provided for your protection and may not be altered in any manner. Hard hats are the property of Lauren Engineers & Constructors, Inc., not the employee, and will be returned at the conclusion of the employee's tenure on the project. Hard hats will be worn as designed, bill forward.

Eye Protection (Safety Glasses)

Safety glasses, those meeting the ANSI Z87.1-1989 standard, with securely attached side shields are mandatory at all times in the project work area. Safety glasses are the basic form of eye protection.

Double eye protection shall be worn whenever you are performing a high hazard operation such as welding, grinding, chipping, etc. Double protection shall consist of safety glasses or goggles plus a full -face shield or welding hood. The company will provide clear replacement lens for welding hoods and burning goggles.
If you normally wear prescription eyeglasses, you can comply with this eye protection policy in three ways: 1) the Company will provide safety glasses that can be worn over your prescription "street" eyewear, 2) the Company will provide goggles that can be worn over your prescription eyewear, or 3) you can purchase approved prescription safety glasses through a Company provided discount program. If you need prescription safety glasses, contact your supervisor for additional information.

Burning goggles with the proper shade density must be worn for flame cutting or welding and full welding hoods are required for arc and heli-arc welding. The shaded lens must be free of cracks or breaks.

Hearing Protection
Hearing loss is a workplace injury, all too often ignored because it usually happens gradually over a period of time. Excessive noise can cause nerve damage, which is irreparable. Hearing aids are of no help and there is no known cure.

The company will furnish hearing protection to all employees. The devices, ear plugs or ear muffs, will be designed to maintain exposure levels at or below 90 dba averaged over an 8-hour period of exposure.
For work performed in operating plants, the company will comply with all portions of the plant's hearing protection policy, which exceeds the company policy. It is the responsibility of each employee to utilize the hearing protection provided by the company.

Hand Protection
Fingers, hands and arms are injured more often than any other parts of the body. You must wear hand protection when you are exposed to hazards such as those from skin absorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns and harmful temperature extremes.

When working with chemicals, gloves should be folded with a cuff to keep liquids from running inside your glove or onto your arm. Vinyl, rubber or neoprene gloves are sufficient when working with most chemicals. However, if you work with petroleum-based products, a synthetic glove will be needed. Leather or cotton knitted gloves is appropriate for handling most abrasive materials. It is dangerous to wear gloves while working on moving machinery. Moving parts can easily pull your glove, hand or arm into the machine. Your supervisor will instruct you on the best type of hand protection available for your job. Make sure your gloves fit properly.

Foot Protection
Sturdy leather work boots or specifically designed safety shoes are a requirement on all Lauren projects. Tennis shoes, loafers or other types of lightweight footwear is strictly prohibited. Employees reporting for work with improper footwear will be sent home. The Company will issue rubber boots as work assignments or operating conditions dictate. If steel toed safety shoes are an employment requirement of the client, all prospective employees will be notified prior to employment. Foot injuries most likely to occur on site include heavy or sharp objects falling on your foot, something rolling over your foot, and stepping on an object that penetrates the sole of your boot or shoe.

Respiratory Protection
In emergencies, or when engineering controls are either not feasible or inadequate to protect against harmful exposure to airborne contaminates, the Company will provide appropriate respiratory protection. Some of the most common hazards to the lungs are the lack of oxygen, and the presence of harmful dust, fogs, smokes, mists, fumes, gases, vapors, or sprays. Because of the varying nature of the potential hazards, specialized training is required in the use and care of respiratory protection equipment. The Company will provide this training, prior to the commencement of the work, should the use of respirators be necessary.

Special Protective Clothing
Some work activities require specialized protective clothing. Specific standards, MSDS recommendations, or experience may determine the proper protective clothing. Your supervisor will advise you of any special protective clothing needed. The requirements will be reviewed and approved by the safety department, if necessary.

SOME ACCIDENTS LAST A LIFETIME

b. Fall Protection

Falls are the leading cause of fatalities in the construction industry. Where a fall hazard exists, there are only two acceptable options: 1) eliminate the hazard or, 2) provide protection against it. Ideally it is best to totally eliminate

the hazard, but since this often cannot be done, OSHA standard 1926 Subpart M, specifies six fall protection systems which can be used for employee protection: 1) guardrail system, 2) personal fall arrest system, 3) safety net system, 4) warning line system, 5) controlled access zones and, 6) safety monitoring system. Because the majority of our work will use the guardrail or personal fall arrest systems they are outlined below. Should you encounter work where you cannot be protected by one of these two systems, further training will be required before using another method. A fall hazard exists when your working/walking surface has an unprotected side or edge which is 6 ft. or more above a lower level.

b.1. Guardrail Systems

The guardrail system is preferred to the personal fall arrest system because it prevents the fall rather than minimizing its impact after the fact. The main requirements of the guardrail system are:

- The top rails must be 42" plus or minus 3" above the working level.
- Midrails or screens must be used if there is no wall at least 21" high.
- Midrails, when used, must be midway between the top rail and the working surface. Screens or mesh, if used, must extend from the top rail to the working surface.
- There can be no opening in the system greater than 10" wide.
- The guardrail system must be capable of withstanding a force of 200 pounds either outward or downward. The midrail must withstand a force of 150 pounds.
- Posts can be no more than 8 feet on center.

b.2. Personal Fall Arrest System

Consider the following, the distance you will fall in a specified amount of time can be determined by the formula:

distance fallen = 1/2AT

where A = gravity at 32 ft./sec. and T = time

So in one second you can fall 16 feet, in two seconds, 64 feet. Not much time to react. The whole purpose of a personal fall arrest system is to minimize the fall distance and therefore the resulting impact to your body.

This is referred to as a "system" because it's made up of different components. Should any of these components fail, the system fails. A personal fall arrest system consists of : the anchor points, connectors, a body harness and a deceleration device.

b.2.1. Anchor Points

- Your anchor point must be capable of supporting several times the force of your fall. Never anchor to conduit, light fixtures, cable hangers, or anything else that is not designed to take a sudden heavy load. If an adequate support anchor is not available to secure the lanyard, a lifeline secured between two weight-bearing anchor points, or an equivalent method, must be used for securing the lanyard.
- A safe anchorage is above where you are working. Any anchor point below the D-ring of the harness will add to the distance of your fall.
- Use an anchor that has no obstacles under it that you could fall into. When checking the possible fall path, be sure to allow for the free-fall distance, deceleration distance, and the distance your lifeline may stretch. (NOTE: Horizontal lifelines must be designed and installed under the supervision of a qualified person.

b.2.2. Connectors

- The maximum length of a lanyard is 6 feet. DO NOT connect two or more lanyards together to provide additional length.
- All lanyards must be equipped with a locking type snap hook.
- Do not tie a knot in the lanyard, as it reduces the lanyards strength.
- Use tie-off straps around H or I beams to prevent cutting. Do not tie-off around rough or sharp edges.
- Inspect your lanyard prior to each use. If damaged DO NOT USE IT. REPLACE IT.

b.2.3. Body Harness

- Inspect your harness prior to each use. If damaged DO NOT USE IT. REPLACE IT.

- The harness will not provide any protection if all belts and straps are not completely buckled. Check that the harness is snug but allows full movement.

b.2.4. Deceleration Device

- Commonly referred to as "shock absorbers", they aid in slowing your free fall so there is less impact on your body. Don't use a lanyard which is not equipped with one of these devices.

b.2.5. Harness/Lanyard Inspection

- Strap & Webbing – Inspect for frayed or broken strands. Broken webbing strands generally appear as "tufts" on the webbing surface. Bend the straps and webbing to make damaged fibers or cuts easier to see. If exposed to excessive heat, the webbing will become brittle and have a brownish appearance. The fibers will break when flexed. Chemical damage will usually show as a change in color, and will cause a lack of elasticity in the webbing. Watch for frayed edges, cuts, or pulled stitches.
- "D" Rings – Check the rings for distortion, cracks, breaks, and rough edges. The "D" ring bar should be at a 90 degree angle with the long axis of the strap and should pivot freely.
- Belt Tongue & Buckle – The belt tongue receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. Belts must not have additional punched holes. The buckles should be free of distortion in shape and motion. The roller should turn freely on the frame. Check for sharp edges.

WORK SMART
WORK SAFE

c. <u>Hazard Communication</u>

The Occupational Safety and Health Administration (OSHA) established a regulatory standard know as the Hazard Communication Standard, which guarantees that employees have the "RIGHT TO KNOW", the names of and the hazards created by chemicals in the workplace. Lauren Engineers & Constructors, Inc. has a Hazard Communication Program, established to help you protect yourselves from the dangers of existing or potential hazardous chemicals in you work place. The program is kept in the project field office and is available on request to all employees and emergency respondents.

The program can help you better understand the chemical hazards in your work place and includes the following components:

- identification/listing of hazardous chemicals
- material safety data sheets (MSDS) for chemicals used in your work place
- proper labeling of chemical hazards
- training related to hazardous chemicals

Because we are not the manufacturer, importer, or distributor, Lauren Engineers & Constructors, Inc. will not make a determination if a chemical is hazardous, but will rely on the evaluation performed by the manufacturer or material supplier and follow their recommendations from the MSDS. We will maintain these material safety data sheets of chemical products supplied through the company for use on-site.

Materials received at the jobsite must be properly labeled. The labels need to contain the following information:

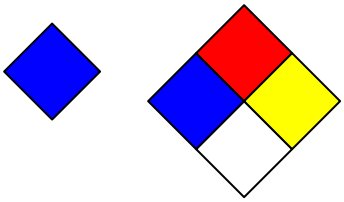
- identity of the chemical product or substance in the container
- hazard warnings
- name & address of the manufacturer

All employees will receive general training in the handling of chemical products, and specific tasks may require more extensive training. This information will include, but not necessarily be limited to:

- An explanation of the Hazard Communication Standard..
- An explanation of the project Hazard Communication Program and its location.
- Interpretation of material safety data sheet information and hazard warning label system(s)
- Notification of the locations of the hazardous chemicals.
- Measure(s) you can take to protect yourself from hazards, i.e. work practices, personal protective equipment, and emergency procedures.

c.1. NFPA Labels - National Fire Protection Association

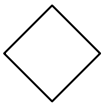
Health Hazard
4 Deadly
3 Extreme Danger
2 Hazardous
1 Slightly Hazardous
0 Normal Material



Fire Hazard
Flash Points
4 Below 73 F
3 Below 100 F
2 Below 200 F
1 Above 200 F
0 Will not Burn

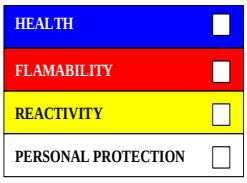
Reactivity
4 May Detonate
3 Shock & Heat may Detonate
2 Violent Chemical Change
1 Unstable if heated
0 Stable

Specific Hazard
ACID- Acid
ALK- Alkali
COR- Corrosive
OXY- Oxidizer
P- Polymerization
W - Use No Water



c.2. HMIS Labels - Hazardous Materials Identification System

Health Hazard
4 Extreme – may be fatal on short exposure
3 Serious – avoid skin contract & inhalation
2 Moderate – may be harmful if inhaled or absorbed
1 Slight – may cause slight irritation
0 Minimal – small degree of toxicity



Flammability
4 Extremely Flammable; flash point below 73 F
3 Seriously Flammable; flash point 73-100 F
2 Moderate Combustible; flash point 100-200 F
1 Slight; requires strong heating to ignite
0 Minimal; won't burn under normal conditions

Reactivity
4 Extreme; explode at room temperature
3 Serious; may explode if shocked, heated or mixed with water
2 Moderate; may react with water
1 Slight; may react if heated or mixed with water
0 Minimal; does not react with water

Personal Protection
A safety glasses
B safety glasses & gloves
C safety glasses, gloves & protective clothing
D face shield, gloves & protective clothing
E safety glasses, gloves & dust respirator
F safety glasses, gloves, protective clothing & respirator
G safety glasses, gloves & vapor respirator
H splash goggles, gloves, protective clothing & vapor respirator
I safety glasses, gloves & dust/vapor respirator
J splash goggles, gloves, protective clothing, & dust/vapor respirator
K airline respirator, gloves, full protective suit & boots
X ask supervisor for special handling instructions

c.3. MSDS Sections

1. Material Identification
2. Ingredients and Hazards
3. Physical Data
4. Fire and Explosion Data
5. Reactivity Data
6. Health Hazard Information
7. Spill, Leak & Disposal Procedures
8. Special Protection Information
9. Special Precautions & Comments

c.4. Common Definitions

- CEILING LIMIT (C) = exposure should never exceed this level
- EVAPORATION RATE = the rate at which a liquid becomes vapor – the higher the number the faster the rate therefore a possible fire or inhalation hazard
- LFL – UFL = lower and upper flammability limits (lean/rich mixture)
- FLASH POINT (FP) = lowest temperature which a vapor would be given off to form an ignitable mixture – the lower the temperature the greater the hazard. i.e. FP for gasoline = -45°F, kerosene is +122°F
- PERMISSIBLE EXPOSURE LIMIT (PEL) = set by OSHA standard – usually given as the amount of exposure an employee can be subjected to, averaged over an 8-hour period, without adverse effects
- PPM = parts per million – parts of vapor or gas per million parts of air by volume (for comparison: 1 PPM would equal 1" in 16 miles, or 1 minute in two years)
- VAPOR DENSITY = the "weight" of the vapor when compared to air at 1 – if the VP is greater than 1 the substance will "sink" and be found in low lying areas
- POLYMERIZATION = small molecules combining to form larger molecules – the faster the rate the greater the chance for fire or explosion
- ACUTE = health problems which show up almost immediately after exposure
- CHRONIC = health problems which develop gradually over time often from prolonged or repeated exposure
- FLAMMABLE LIQUIDS = liquids having a flash point of less than 100F, i.e. gasoline, acetone
- COMBUSTIBLE LIQUIDS = liquids with a flash point greater than 100F, i.e. diesel fuel
- IDLH = immediately dangerous to life and health – the maximum concentration from which one could escape within 30 minutes without any impairing symptoms or irreversible health effects.
- pH = the value that represents acidity or alkalinity. Pure water has a pH of 7, less then 7 is an acid, greater than 7 is an alkaline.
- SPECIFIC GRAVITY = an expression of the density (or heaviness) of a material. Water is 1.0. Most flammable liquids have a specific gravity of less than 1.0 and, if not soluble, will float on water.

d. Confined Space Entry

A confined space, as defined by OSHA, is: 1) large enough and configured in such a way that an employee can bodily enter and perform assigned work, 2) has limited means for entry or exit, and 3) is not designed for continuous occupancy. Examples of confined spaces include storage tanks, process vessels, bins, boilers, ventilation and exhaust ducts, sewers, underground utility vaults, excavations, manholes, tunnels, and pipelines.

For the purpose of safe working requirements, confined spaces are classified as either non-permitted or permitted. The difference is **extremely important** to understand. A **non-permit confined space** means a space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm. A **permit-required confined space** means a confined space that has one or more of the following characteristics:

- contains or has the potential to contain a hazardous atmosphere
- contains a material that has the potential for engulfing an entrant
- has an internal configuration that would allow an entrant to be trapped or asphyxiated by inward converging walls or downward sloping floors to a smaller cross section
- contains any other recognized serious safety or health hazard

At no time is a Lauren employee to enter a confined space without specific direction from a Lauren supervisor. Entry into a permit-required confined space requires specific training for all participants, prior to any of the work starting. You will be instructed in:

- The types of hazards you might be exposed to.
- The necessary precautions you will need to take for each type of hazard.
- The symptoms you may experience in the event of overexposure to the hazards.
- The engineering or administrative controls and/or personal protective equipment, which will be used to protect you from potential hazards.
- Procedures to be used throughout the space entry assignment, such as lockout/tagout, method(s) of communication, the permit system, and monitoring.

d.1. General Procedures

- Prior to the start of any confined space entry, the site specific lockout/tagout procedures must be followed in order to isolate the space.
- The confined space must be purged by the circulation of uncontaminated air.
- The space must be tested for atmospheric hazards. The test must include, in this order, 1) oxygen deficiency, 2) combustible gases and vapors and, 3) toxic gases and vapors. If any of the limits noted on the permit are exceeded, **no entry will be allowed**.
- Low voltage or GFCI protected lights and power cords will be used inside the space.

d.2. Participants

As previously noted, no entry can be made into a permitted space until all participants have been instructed in the potential hazards and their specific responsibilities. There are three categories of active participants in any permitted space entry, each with defined responsibilities.

d.2.1. Responsibilities of the Entry Supervisor

- Know the hazards that may be faced during entry
- Verify that all conditions of the permit have been met
- Terminate entry when operations are completed or a prohibited condition arises
- Verify that the rescue team is available and the means of summoning them is operational
- Remove any unauthorized person who has entered the space
- Continually review the entry operation to ensure all conditions of the permit are being complied with

d.2.2. Responsibilities of the Outside Attendant

- Know the hazards that may be faced during entry
- Know the possible effects of hazard exposure
- Continuously maintain an accurate count of the entrants
- Remain outside the space until relieved by another attendant
- Maintain communication with the entrants

- Monitor activities both inside and outside the space to determine if it is safe for the entrants to remain inside. Order an evacuation if necessary.
- Summon the rescue team if needed
- Keep unauthorized entrants from entering the space
- DO NOT perform any other duties which would interfere with the primary responsibilities of attendant
- **Under no circumstance is the attendant to enter the confined space.**

d.2.3. Responsibilities of the <u>Authorized Entrant</u>

- Know the hazards you may face during entry
- Properly use all equipment provided
- Maintain communication with the attendant
- Know when to alert the attendant of some condition that has changed within the space that would cause the attendant to evacuate
- Exit from the space as quickly as possible whenever: 1) the attendant gives an order to evacuate, 2) you recognize a warning sign of overexposure, 3) you detect a prohibited condition or, 4) an evacuation alarm is activated.

SAFETY IS NO ACCIDENT!
IT MUST BE PLANNED!

e. <u>Lockout/Tagout (LOTO)</u>

This section is NOT intended to train you for the correct lockout/tagout procedures of your particular jobsite. There are simply too many variables, mainly due to client/owner requirements and specific circumstances. This IS intended to provide you with an overview of what is required in any lockout/tagout procedure, and what YOU need to understand regardless of what system is in place. It is your supervisor's responsibility that all effected employees are informed AND understand the specifics of the program in use at your project.
It is the policy of Lauren Engineers & Constructors that <u>any</u> lockout/tagout system ultimately provides a **Zero Mechanical State, or ZMS**. This has been established to prevent hazards resulting from unexpected or unwanted operation of equipment during construction/maintenance activities. This **ZMS** concept includes not only the locking out of electrical energy but also requires that all energy be isolated, blocked, supported, restrained or controlled to the extent that such energy will not be released unexpectedly. The intent is to control ALL sources of energy defined as electrical, chemical, hydraulic, thermal, pneumatic and mechanical potential.

Listed below are general rules you need to be aware of regardless of the system in use.

- All residual and stored energy must be drained or dissipated. Zero energy **must be verified** by attempting to start the equipment, checking voltage, checking pressure or by any other means necessary to ensure there will be no unexpected energy release and the equipment cannot be started. **This point cannot be overemphasized.**
- No Lauren employee shall work on any system, process, or piece of equipment which requires a lock and/or tag without a Lauren lock and/or tag being used. **DO NOT WORK UNDER ANOTHER COMPANY'S LOCK/TAG.**
- During maintenance type tasks in an existing facility, no Lauren employee should pull a disconnect, close a breaker, shut a valve, etc. without the direction of an authorized client representative. It's their facility, and how a system or piece of equipment is isolated is determined by their procedures.

- Only the person whose name appears on the tag may remove that tag and/or lock. **Never remove someone else's lock or tag.**
- Never assume that a task is too small, or of too short a duration, to merit locking out. Don't yield to the temptation to bypass lockout procedures because they seem an unimportant nuisance.
- Finally, it must be remembered that the existence of locks, lockout devices, and tags do not make a lockout program. They are of no use if they are not properly employed on every appropriate occasion.
- When reenergizing equipment the following applies:
  - A qualified person must conduct tests and visual inspections to verify all tools, jumpers, grounds, etc. have been removed.
  - Employees exposed to the hazards associated with reenergizing shall be warned to stay clear.
  - All locks and tags must be removed.
  - There must be visual determination that all employees are clear of the circuits and equipment.

f. <u>Hand and Power Tools</u>

Five basic safety rules can help prevent hazards associated with the use of hand and power tools:

- Keep all tools in good condition with regular maintenance.
- Use the right tools for the job.
- Examine each tool for damage before use and do not use damaged tools.
- Operate tools according to the manufactures' instructions.
- Use the proper PPE **correctly**.

f.1. Hand Tools

OSHA defines hand tools as those which are powered manually. They can include anything from axes to wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance. A few examples illustrate the point:

- Using a screwdriver as a chisel may cause the tip of the screwdriver to break and fly off hitting the user or another employee.
- If the wooden handle on a hammer is loose, splintered, or cracked, the head of the tool could fly off hitting the user or another employee.
- If the jaws of a wrench are sprung, the wrench might slip.
- If impact tools, such as chisels, wedges, or drift pins have mushroomed heads, the heads may shatter on impact sending sharp fragments flying.

So while it is Laurens responsibility to supply tools in safe condition, it is <u>your responsibility</u> to properly use and maintain them.

f.2. Power Tools

The types of power tools are determined by their power source: electric, pneumatic, liquid fuel, hydraulic, and powder-actuated. To prevent hazards associated with the use of power tools, observe these general precautions:

- Never carry a tool by the cord or hose.
- Never yank the cord or the hose to disconnect it from the receptacle.
- Keep cords and hoses away from heat, oil, and sharp edges.
- Disconnect tools when not using them, before servicing and cleaning them, and when changing accessories such as blades, bits, and cutters.
- Keep all people not involved with the work at a safe distance from the work area.
- Secure work with clamps or a vise, freeing both hands to operate the tool.
- Avoid accidental starting. Do not hold your fingers on the switch button while carrying a plugged-in tool.
- Maintain tools with care; keep them sharp and clean for best performance.
- Follow instructions in the user's manual for lubricating and changing accessories.
- Be sure to keep good footing and maintain good balance when operating power tools.
- Wear proper apparel for the task. Loose clothing or jewelry can get caught in moving parts.
- Remove all damaged portable electric tools from use and tag them: **"Do Not Operate"**. Inform your supervisor.

f.3. Power Tool Hazards by Type

Listed below are <u>some</u> examples of the hazards and precautions associated with different types of power tools.

f.3.1. Electric Tools

When using electric tools you must be aware of several dangers, the most serious of which are electrical burns and shock. These can lead to anything from heart failure to causing you to fall from a ladder or other elevated work surface. To protect yourself from shocks and burns all electric tools must have either a three-wire cord with a ground and be plugged into a grounded receptacle or be double insulated. Use GFCI protection on all temporary power cords.

f.3.2. Portable Abrasive Wheel Tools

Portable abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments, therefore abrasive wheel tools must have guards. Before and abrasive wheel is mounted, it must be closely inspected for damage and should be sound, or ring, tested to ensure it's free of cracks or defects. To test, wheels should be tapped gently with a light, non-metallic instrument. A stable and undamaged wheel when tapped will give a clear metallic tone or "ring". Also pay close attention to the RPM rating of the wheel to ensure the tool does not exceed that rating.

f.3.3. Pneumatic Tools

The foremost danger in working with pneumatic tools is the potential for being hit by one of the tool's attachments or by some type of fastener you may be using with the tool. You must check to ensure the tool is securely fastened to the air hose. Use a safety clip or retainer on installed attachments. Make sure to use all the proper personal protective equipment such as eye, face, and hearing protection.

f.3.4. Liquid Fuel Tools

Fuel powered tools are usually operated on gasoline. The most serious hazard associated with the use of fuel powered tools comes from fuel vapors that can burn or explode and also give off dangerous fumes. Be careful to handle, transport, and store gas or fuel only in approved containers. Before refilling, shut down the engine and allow it to cool to prevent the accidental ignition of vapors. Make sure there's proper ventilation to avoid breathing carbon monoxide. Fire extinguishers must also be available.

f.3.5. Powder-Actuated Tools

These tools operate like a loaded gun and therefore must be treated with extreme caution. You are not authorized to use this type of tool unless you have been specifically trained.

f.3.6. Hydraulic Power Tools

The manufactures' recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings must not be exceeded. All jacks must have a stop indicator, and the stop limit must not be exceeded. Also, the manufactures' load limit must be marked on the jack, and the load limit must not be exceeded. Never use a jack to support a lifted load. Once the load is up, it must be immediately blocked. Put a block under the base of the jack when the foundation is not firm, and place a block between the jack cap and the load if the cap might slip. **Never place any part of your body under the load being lifted.**

g. Rigging

g.1. General Requirements

- All rigging equipment for material handling must be inspected **prior to use** on each shift, and as necessary during use to ensure that it is safe. **Defective rigging equipment must be removed from service.**
- Recommended safe working load charts can be found in Tables H-1 through H-20 in Subpart H of the OSHA 1926 standards for construction.
- Slings must not be shortened with knots, bolts, or other makeshift devices.
- Slings must be padded or protected from any sharp edges on the load.
- **All employees shall be kept clear of all loads about to be lifted, and NEVER under any circumstances, walk, stand, or reach any part of your body under, or in the path of a suspended load.**
- Decreasing the sling angle (the angle of the sling leg with the horizontal load) on a two-legged sling, increases the stress on each leg, even though the load remains constant. For example: lifting 1000 lbs. with two slings at 90° puts 500 lbs. of stress on each leg, decrease the angle to 45° the stress per leg becomes 707 lbs., decreasing the angle to 30° puts 1000 lbs. on each, an angle of 15° raises the stress to 1932 lbs. Therefore decreasing the sling angle, decreases total lifting capacity. This decrease in lifting capacity also applies to angles when a single sling is used as a choker.
- Don't permit bending around a corner near a splice or an attached fitting.
- Before unhooking, all loads must be safely landed and properly blocked. Never attempt to pull slings from under a load that is setting on them.
- Ensure all hooks, except shakeout hooks, have a safety latch, or "keeper", and that it is working properly.
- Hoist signals must only be given by a qualified person who has been specifically designated and authorized to do so.

- Use tag lines for any load which could become unmanageable to prevent it from swinging. Ensure the excess line is tended in order not to snag the load.
- Slings are to be used for lifting and moving. Wrapping the load line around the object is prohibited.

g.2. Wire Rope Sling Inspections

The following factors are sufficient to immediately remove a sling from service:

- Ten randomly distributed broken wires in one rope lay. (NOTE: Rope lay is defined as the lengthwise distance on a wire rope in which one strand makes one complete turn around the rope.)
- Five broken wires in one strand in one rope lay.
- Kinking, crushing, birdcaging, or any other damage resulting in distortion of the rope structure.
- Evidence of heat damage from scorching or slag spatter.
- Reduction in the rope diameter or stretching.
- Crushing or corrosion of the rope or end attachments.

g.3. Synthetic Web Sling Inspections

Synthetic webbed slings must be marked or color coded to show; 1) the name or trademark of the manufacture, 2) rated capacity for the type of hitch, and 3) the type of material. They must be removed from service if any of the following conditions are present:

- Acid or caustic burns
- Melting or charring of any part of the sling surface
- Snags, punctures, tears, or cuts
- Broken or worn stitches
- Distortion of fittings
- The "wear threads" are showing through.

h. Ladders & Stairways

OSHA estimates that there are 24,882 injuries and as many as 36 fatalities per year due to falls from stairways and ladders used in construction. Nearly half of these injuries are serious enough to require time off the job. By following the requirements found in 1926.1050 through 1926.1060, many of these injuries can be prevented. The highlights are listed below.

h.1. Ladders

- ALWAYS inspect the ladder prior to use. Ladders with structural defects, such as broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components must be immediately be taken out of service, tagged "**Do Not Use**" or marked so they are clearly identified as defective.
- Use the four to one rule when setting up an extension ladder, one foot out from the base for every four feet of ladder height.
- Ladders used for access to a floor or platform must extend at least **36** inches above such a floor or platform.
- Portable extension ladders must be secured from being displaced; tied at the top, blocked at the bottom, or otherwise prevented from movement. Have someone hold the ladder while you're tying it off at the top.
- Place ladders on firm level footing to avoid possible tipping. All portable extension ladders must be equipped with safety feet.
- If the work extends beyond the normal reach of the ladder, climb down and move the ladder. Don't overextend your body past the ladder siderails.
- DO NOT use individual sections of an extension ladder as a single ladder.
- DO NOT lean a stepladder against an object and use it as an extension ladder. When using a stepladder ensure to engage the snap spreaders in the fully open position. Don't work higher than the second step from the top.
- Always ascend or descend facing the ladder, keeping both hands free.
- Metal ladders are NOT allowed on Lauren projects unless specifically authorized by project management.
- Don't splice ladders together, or improvise with such items as boxes, barrels, chairs, sawhorses, etc. in order to gain more height.
- Ladders placed in any location where they can be displaced by workplace activities of traffic, such as passageways or doorways, must be protected from accidental displacement.
- Wooden ladders shall not be painted, as the paint may hide defects.

h.2. Stairways

- Stairways that will not be a permanent part of the structure must have landings of not less than 30" in the direction of travel and extend at least 22" in width at every 12 feet or less of vertical rise.
- Stairs will be installed between 30° and 50° from the horizontal.
- Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width of the platform to less than 20 inches.
- Stairways having four or more risers or rising more than 30" shall have; at least one handrail, and one stairrail system along each unprotected side or edge.
- Stairrails must not be less than 36" in height and must be provided with midrails, screens, mesh, or intermediate vertical members.
- Handrails and the top rails of stairrail systems must be capable of withstanding a force of at least 200 pounds in any outward or downward direction.
- Unprotected sides and edges of stairway landings must be protected with a typical guardrail system.

i. Electrical

Safety should be foremost in your mind when working with electrical equipment. You face hazards from job site conditions, your tools, and the electricity that powers them.

i.1. How Shock Occurs

Electricity travels in closed circuits, and its normal route is through a conductor. Shock occurs when the body becomes a part of the electrical circuit. This normally happens when the person comes in contact with:

1. both wires of the electric circuit,
2. one wire of an energized circuit and the ground or,
3. a metallic part of the tool has become "hot" by being in contact with an energized wire, while the person is in contact with the ground.

i.2. Insulation & Grounding

Insulation and grounding are two means of preventing injury during electrical equipment operation. Conductor insulation may be provided by placing nonconductive material around a conductor. Grounding may be achieved through the use of a direct connection to a known ground. If a "hot" wire contacts a grounded enclosure, a ground fault results which will normally trip a breaker or blow a fuse. Most portable electric tools are grounded by this means. **There is one disadvantage to grounding**: a break in the grounding system may occur without the user's knowledge. Insulation may become damaged and if this damage causes the conductors to become exposed, the hazards of shocks, burns, and fire will exist. Double insulation may be used as additional protection on the live parts of the tool, BUT double insulation does not provide protection against defective cords, plugs or heavy moisture conditions. The use of a ground fault circuit interrupter (GFCI) is one method to overcome grounding and insulation deficiencies.

i.3. Ground Fault Circuit Interrupters (GFCI)

The GFCI is a fast acting circuit breaker which senses ground-fault leakage too small to trip a circuit breaker, but large enough to be dangerous. The GFCI continually matches the amount of current going to an electrical device against the amount of current returning from the device along the electrical path. Whenever the amount "going" differs from the amount "returning" by approximately 5 milliamps, the GFCI interrupts the electrical power in as little as $1/40^{th}$ of a second. The GFCI will not protect you from line-to-line hazards (such as holding two "hot" wires, or a "hot" and neutral wire in each hand), but it does provide protection against the most common form of electrical shock hazard – the ground fault.

i.4. General Electrical Safe Work Practices

- Visually inspect all electrical equipment and tools prior to use. Any defects such as frayed cords, cracked casings, broken switches, etc. MUST be corrected by taking the tools out of service, tagging it "**Do Not Operate**" or "**Defective**", until the problem is resolved. **DO NOT USE DEFECTIVE TOOLS.**

- Unless you're an electrician, or have been authorized by your supervisor, DO NOT attempt repairs on defective tools.
- DO NOT remove ground prongs or use tools/cords where this has occurred. They are defective. If the equipment ground is not continuous because the ground prong has been removed, the path of least resistance from the tool may be through your body.
- Use GFCI protection on all extension cords and temporary wiring.
- DO NOT install or use electrical components in a manner for which they were not designed. For example, don't supply temporary power by fitting a power cord to a multiple receptacle box, which was designed to be mounted, then set it on the floor to provide power, or use ROMEX wire to makeup extension cords.
- Make sure all cords in use for portable tools are designated for HARD or EXTRA HARD service. Examples of designations you might find on the cords are S, ST, SO, STO, SJ, SJO, SJT and SJTO. "Flat" cords are not acceptable because the insulated conductor must be surrounded by an insulating jacket.
- Reinforce the simple work practice of removing cords from the receptacles by pulling on the plug, not on the cord.
- As much as possible, keep cords (cables and air hose also) out of walkways and high traffic areas – not only to protect the cords but to prevent tripping hazards.

ACCEPT NO COMPROMISE ON YOUR SAFETY!!

j. Scaffold Use

Specific requirements for many different types of scaffolding can be found in OSHA regulations 1926 Subpart L. The scaffolds referred to here are the most commonly used on LEC projects, that is "supported" types such as fabricated tube frame and system type staging. The hazard identification and safe work practices are in reference to these types, and do not include such tools as suspended scaffolds. Should you be required to work from other scaffolding configurations, you will require further information and training.

j.1. Basic Elements of a Safe Scaffold

- Supported scaffold legs, posts, frames, or uprights must be set on baseplates and mud sills or other adequate firm foundations. Unstable objects, such as concrete blocks, boxes, and loose bricks, cannot be used to support scaffolds.
- Cross, horizontal and/or diagonal bracing must be installed to ensure that the erected scaffold is plumb, level, and square. All brace connections must be secured.
- Each platform on all working levels must be fully planked, with the front edge of the platform no more than 14" from the face of the work, unless protected by a guardrail or personal fall arrest system.
- Each end of the platform, unless cleated or otherwise restrained, must extend over the centerline of the support at least 6 inches.
- On scaffolds where the platforms are overlapped to create a long platform, the overlap can occur only over supports, and shall not be less the 12" unless nailed or otherwise restrained.
- Access to the working platform(s) must be by means of an attachable ladder, staircase or horizontal members of welded frame staging designed for that purpose. Climbing the cross bracing is NOT an acceptable means of access.

j.2. Fall Hazards & Fall Protection

While it has recently become common to equate "fall protection" with the use of a personal fall arrest system (see Section 11b), on supported scaffolding, the primary fall protection method is the guardrail system. Guardrails are superior to the personal fall arrest system because guardrails prevent the fall from occurring, while the use of a harness and lanyard only minimize the impact force on your body after the fall has happened. Of course in situations where a guardrail system is impossible to install, the personal fall arrest system must be used, if the fall hazard exposure is greater than 6 feet.

j.3. Electrical Hazards & Protection

Electrical hazards associated with scaffold work are much the same as those encountered while working in other areas, therefore the same basic precautions apply, such as:

- properly grounded tools
- the use of GFCIs on cords
- extension cords rated for hard or extra hard service
- welding cable and electrode holders in good condition

But specific to the use of scaffolds near power lines, the following minimum clearances must apply:

Insulated Lines

- <300V 3 feet
- 300V – 50kV 10 feet
- >50kV 10 feet + ½"/1kV>50

Uninsulated Lines

- <50 kV 10 feet
- >50kV 10 feet + ½"/1kV>50

The only times scaffolding or materials can be closer than the clearances specified above is: 1) if the lines have been deenergized (may require LEC lockout/tagout), 2) the lines have been relocated or, 3) protective covering has been installed to prevent accidental contact.

j.4. Falling Objects & Protection

There are two obvious problems facing scaffold users regarding the potential for falling objects: 1) something being dropped on you from above or, 2) users dropping something on other workers below. Techniques to protect yourself from bring hit by an object from above include:

- sequencing the work to eliminate work being done overhead at the same time
- installing debris nets or a canopy to deflect falling objects
- strict adherence to the use of hardhats

To help protect workers below the scaffolding:

- barricade the area below and not allow employees inside the hazardous area
- sequence the work to eliminate the tasks being performed below
- toeboards with paneling, screening, or mesh to the top rail of the guardrail system
- a debris net or canopy strong enough to withstand the impact of any potential falling objects

j.5. Material Handling & Work Practices

- Stack materials to a height as low as possible.
- Keep access ways clear of obstructions and debris.
- Make sure the weight of the material does not exceed the intended load capacity of the scaffold.
- Secure all loose and light weight material.
- If handling material near electrical lines, designate someone to ensure proper clearances are maintained.
- Use tag lines to move material on/off the scaffold.
- Stay alert to wind forces.
- DO NOT use a scaffold taller than 4 times the minimum base dimension, unless it's been tied off or braced to prevent tipping.
- DO NOT make alterations to a scaffold. This work must be done under the supervision of a competent person.
- DO NOT use a scaffold if you notice that any component has been damaged.

k. Aerial Lifts

Only authorized personnel will be allowed to operate any aerial lifts, such as extendable and articulating boom platforms.

- Prior to the use of any lift, a pre-start inspection must be performed. DO NOT operate the machine until any defects found have been corrected.
- A harness with lanyard is required while working from a lift. Ensure that the tie-off point is the proper attachment bar for the machine. NEVER tie-off to an adjacent object or structure.
- Always position the boom in line with the direction of travel.
- DO NOT travel or work the machine on soft or uneven surfaces where tipping could occur.
- Maintain safe clearances from electrical lines and equipment. You must allow for platform sway, rock or sag in addition to the electrical line swaying. A minimum distance of 10 feet must be maintained from any electrical line 50kv or less.
- When riding in or working from the platform, both feet must be positioned on the deck.
- Do not allow ground personnel in areas under a raised platform.
- Never disable or modify the foot switch by blocking or any other means.
- Never use the boom for any other purpose other than positioning personnel and their tools. DO NOT attempt to use the machine as a crane.
- NEVER exceed the manufacture's rated platform capacity. The weight rating is the total amount of weight, personnel and tools combined, that the equipment can safely handle. Refer to the chart on the equipment or the capacity indicator on the boom.
- NEVER position steps, ladders or similar items on the unit to provide additional reach.
- Always check clearances around the entire platform and boom when raising, lowering, swinging, or telescoping. Always check turntable clearances before swinging the boom.
- Lower controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.
- NEVER OPERATE A MALFUNCTIONING MACHINE. IF A MALFUNCTION OCCURS – SHUT IT DOWN, TAG IT "**DO NOT OPERATE**", AND CONTACT YOUR SUPERVISOR.

l. Welding & Burning

l.1. Gas Welding and Cutting

- When transporting or storing cylinders, the valve protection caps must be in place.
- Oxygen cylinders in storage shall be separated 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 ½ hour.
- Compressed gas cylinders must be secured in an upright position at all times.
- Cylinders containing oxygen or acetylene, or any other fuel gas, shall not be taken into confined spaces.
- Before a regulator to a cylinder valve is connected, the valve shall be "cracked" to clear the valve of dust or dirt that might otherwise enter the regulator. The valve of a fuel gas cylinder shall not be cracked where the gas could reach welding work, sparks, flame, or other possible sources of ignition.
- The cylinder valve shall always be opened slowly to prevent damage to the regulator. When a special wrench is required, it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel gas can be shut off quickly in case of an emergency.
- All hose and torches in use shall be inspected prior to each shift. Defective, or questionable, equipment shall not be used.
- Torches shall be lighted by friction lighters or other approved devices, not by matches, lighters, or hot work.
- Hoses, cables and other equipment shall be kept clear of passageways, ladders and stairs.
- Boxes used for the storage of gas hose shall be ventilated.

l.2. Arc Welding & Cutting

- Only manual electrode holders which are specifically designed for arc welding and cutting, and are of the capacity capable of safely handling the maximum rated current required by the electrodes, shall be used.
- Only cable free from repair or splices for a minimum distance of 10 feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.
- When necessary to splice or connect lengths of cable, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used.
- Cables in need of repair shall not be used.
- Pipeline containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return.

- When electrode holders are to be left unattended, the electrodes shall be removed and the holders placed or protected so they cannot make electrical contact with employees or conducting objects.
- Whenever practicable, all arc welding and cutting operations shall be shielded to protect other persons working in the vicinity from the direct rays of the arc.
- Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use.
- Any faulty or defective equipment shall not be used and immediately reported to your supervisor.

m. Asbestos & Lead Awareness Policy

As a matter of standard operating policy, **UNDER NO CIRCUMSTANCES** are any employees of Lauren Engineers & Constructors to involve themselves in either the application or removal of any material containing asbestos OR lead, nor are you to be in the area where such operations are taking place. Should you become aware of the possibility of involvement in the above operations, contact your supervisor immediately.

n. Lifting

Back problems are one of the most serious types of injuries in construction. They are difficult to treat, may require surgery, can cause prolonged periods of painful recuperation, and drastically reduce your ability to enjoy off-the-job pursuits. Most back injuries are cause by:

1. lifting incorrectly, or
2. failing to use mechanical lifting equipment

There are four basic rules to remember when lifting:

1. **Lift with your legs and arms instead of your back.**
2. **Never twist or turn while lifting.**
3. **Never bend your back without also bending your knees.**
4. **Keep the load as close to your body as possible.**

Look for the best place to grip and balance the load. If it is too big or heavy, **get help**. Have a level and firm footing, then get close to the object by bending your knees, keeping the back as straight as is comfortable. Raise the object slowly by straightening your legs. This puts the load on the leg and shoulder muscles. Keep the load close to your body's center of gravity, and carry the load so that it interferes as little as possible with your normal way of walking. If the route is rough, lighten up the load. Always try to have an unobstructed view of where you are going. Lastly, use mechanical equipment to handle heavy or awkward loads. Generally it's available if you look for it and take the time to use it. In fact you are expected to use mechanical or power equipment whenever it's available. Check with your supervisor if you need it.

o. Housekeeping

Housekeeping is not an additional responsibility it is integral part of your job. A clean and organized jobsite has a direct effect on the safety and health of a project, and is therefore mandatory**.**

- Keep tools and working materials in proper locations.
- Store trash, waste, and scrap in correct containers.
- Keep the floors and walkways clear of tools, rod ends, scarp, cords, hoses, etc. As much as possible keep cords, hoses and cables seven feet overhead.
- Ensure that work areas contain only the materials and tools required for the job being done. Pick up tools and scrap as the work progresses.
- Store or contain material so that fire has no place to start.
- Keep all material, tools, and equipment in a stable position (tied, stacked, or chocked) to prevent rolling or falling.
- Maintain clear access to all work areas.
- Immediately clean up, or barricade, areas of spilled liquids.

The results of good housekeeping effect all areas of safety such as fire prevention and the reduction in the likelihood of slips, trips and falls. Everyone gains – it's easier to find items so productivity increases, while at the same time the possibility of an accident is reduced.

p. Excavation

Potential hazards associated with trenching/excavation work include more then the possibility of cave-ins. Other possible dangers can include:

- exposure to falling loads
- existing underground installations
- exposure to vehicular traffic
- hazardous atmospheres
- water accumulation
- stability of adjacent structures

The OSHA requirements for construction excavations are contained in 1926 Subpart P. Here they address the potential hazards noted above. In addition the standard requires that daily inspections be performed on any excavation by a competent person. Inspections are also required throughout the shift as needed, after rainstorms, or any other hazardous occurrence.

p.1. Soil Classifications

OSHA identifies four different soil types:

- Stable Rock – most stable formation, but in general you'll seldom encounter this type of condition
- Soil Type A – most stable such as clay, silty clay and hardpan
- Soil Type B – medium stability such as silt, sandy loam, medium clay and unstable dry rock
- Soil Type C – least stable such as gravel, loamy sand, soft clay and submerged soil

But there is more to soil classification than just soil type such as:

- grain size – the bigger the grains the less stable the soil
- saturation – refers to how much water is in the void between the grains. A certain amount of water makes the soil stable, but too much or too little can cause cave-ins.
- Cohesiveness – refers to how well the grains hold together. It aids in predicting how well the trench wall will hold together.
- Unconfined Compressive Strength – measures the amount of weight per sq.ft. is required to collapse a sample.

All these factors, in addition to the depth of the excavation, are necessary in determining the type of protection required. Protective systems must be used if the excavation is five feet in depth or greater, or if the competent person's examination of the ground indicates a potential for cave-in.

p.2. General Safe Work Practices

- Trenches over four feet deep must have a safe exit such as a ramp or ladder within 25 feet of each worker.
- Underground utilities must be located and marked.
- Excavated material and other objects must be kept at least two feet from the trench opening.
- No one works on the sides of sloped or benched excavations above other employees unless the lower worker is protected from falling material.
- No one is allowed under loads handled by lifting or digging equipment.
- When mobile equipment is operated adjacent to an excavation, or when equipment is required to approach the edge, and the operator does not have a clear and direct view of the edge, a warning system will be used such as barricades, mechanical or hand signals, or stop logs.

q. First Aid & Emergencies

CAUTION: The following instructions are general and not intended to overrule any first aid and/or emergency procedures stated by warning labels, an MSDS, or specific first aid training. But when an accident occurs, either to yourself or a co-worker the steps taken during the first few minutes can be critical.

Be sure you know the emergency procedures on your project. This might include any or all of the following:

- first aid kit(s) and/or on-site medical facilities location
- any alarm warning systems that might be in place
- how to report an emergency and contact response personnel

- the location of any eye wash stations or showers

If you are the first person on an injury scene your first step must be to assess the situation – Is the scene safe for you before attempting any rescue. Too often well intentioned rescuers become victims themselves when they risk their safety to help others. If the area is unsafe, go for help or use the personal protective equipment that will permit you to assist safely. Protecting yourself from infectious disease should also be a consideration. Identifying a person as having a communicable disease can be difficult or impossible. Therefore you must take protective measures to avoid coming in contact with any of the victim's body fluids.

Determine if the victim is breathing. If a spine or neck injury is suspected, DO NOT MOVE THE PERSON UNLESS THE LOCATION POSES A LIFE THREATENING SITUATION. If the victim is conscious, try and find out what's wrong and take steps to help, based on your knowledge, skill and training.

Should you have to call for help, remember there are certain things a dispatcher will have to know:

- the exact location of the accident
- your name and where you are calling from
- a description of what's happened and the extent of injury

Stay on the phone until you're told to hang up. Remain calm and listen carefully as the dispatcher may provide valuable first aid instructions for helping the victim until help arrives.

LAUREN ENCOURAGES ALL EMPLOYEES TO TAKE FORMAL FIRST-AID/CPR TRAINING.

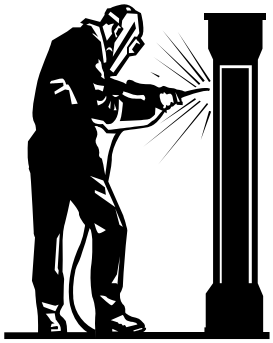
8. Disciplinary Policy

The Company will make every reasonable effort to perform its work in the safest manner possible. We accept responsibility for the safety of our employees and will take all necessary steps to prevent injuries and losses to equipment and property.

Each employee shares in this responsibility for maintaining a safe project. Safety and accident prevention is not a separate function of management, but must be a cooperative effort on the part of every employee. The Company's moral and legal obligations will not allow repeated safe work practice or work rule violations. Willful disregard of known safety requirements and work rules will be cause for the following action:

First Offense: A first violation will normally generate a warning, including a written reprimand, outlining the safety regulation(s) and/or work rule(s) that have been broken. This does not preclude immediate suspension or discharge for serious violations on the first offense.

Second Offense: Repeated safety regulation and/or work rule violations will be cause for immediate suspension or discharge.



ASKING US TO OVERLOOK A SIMPLE SAFETY VIOLATION WOULD BE ASKING US TO COMPROMISE OUR ENTIRE ATTITUDE TOWARDS THE VALUE OF YOUR LIFE.

Anonymous