DOSTER

CONSTRUCTION COMPANY

SAFETY MANUAL

Revised

March 2005

Doster Construction Company

Safety Manual

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Section 1
Safety Policy

Since its formation in 1969, Doster Construction Company, Inc. has been committed to providing not only our employees but those of our subcontractors with a safe work site in which to work. We firmly believe that the personnel that are involved in the construction of our projects are our most important resource. Therefore, we have established this Safety Loss Control Manual to assist our project management teams in their effort to meet our goal of an accident free site for all our projects.

The importance of a safe workplace which contributes to the health, welfare, and continued wellbeing of each Doster employee is a prime objective. By maintaining a safe and healthy work force, other objectives such as high quality of work, maintaining a difficult schedule, and/or achieving a certain level of profit are much easier to accomplish.

Doster has been a leader in the construction industry in many different areas for many years. By continuing to implement the following program, Doster's jobsites will not only be safer, more productive, and more profitable, but Doster will also continue to be on the leading edge in the area of safety management.

In order to accomplish our goal of accident free work sites, it will take the commitment not only of the management, but also that of each person involved on a Doster project. Therefore I challenge you to commit to the hard work necessary to make our program a success.

Doster Construction Company, Inc.

Thomas E. Doster, III
Chairman / CEO and Founder

Doster Construction Company

Safety Manual
Revised 2005
Updated 6/1/06

Safety Statement

While many organizations state Safety as their Goal, we at Doster Construction have integrated Safety as a critical Standard of Performance, and a vital component of all construction activities undertaken by our Company.

Overview

Doster is committed to providing a safe and healthy workplace. To accomplish this, it is Doster's rule and a requirement of all workers on our jobs to comply with federal, state, and local safety and health standards.

OSHA Safety standards will serve as minimum standards with regards to employee and jobsite safety and health.

It shall be the duty and the responsibility of both Doster Construction Company, Inc. and its employees to abide by Section 5 of the Occupational Safety and Health Act of 1970, also known as "the general duty clause," which states:

1. Section 5 (a) Each employer:

    1.1. Has the general duty to furnish each employee with work and a workplace free from recognized hazards that can cuase death or serious physical harm;
    1.2. Shall comply with Occupational Safety and Health Standards promulgated under the Act.

2. Section (b) Each employee:

    2.1. Shall comply with the Occupational Safety and Health Standard and all rules, regulations, and orders issued pursuant to the Act which are applicable to his own actions and conduct

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Foreword

To authorize and establish a formal Safety and Loss Control of Program:

1) Reducing risks of injury and property damage associated with our operations; and
2) Reducing the financial exposure of our company in this area

A "Manual" is defined as a "Handbook of Prescribed Procedures" which means that it is designed to be used for reference purposes and guidance. No manual, however, can outline every necessary procedure for every person, nor can it prescribe procedures to cover every possible situation.

Company Purpose

"Building Lasting Relationships"

Our Mission

"We will be a $500 million company in the top quartile of industry profitability by the year 2010"

Our Quality

Doster is an ISO 9001:2000 Registered Company

Our Web site

www.dosterconstruction.com

Doster's Core Values and Beliefs

- We are committed to the highest standards of ethics and integrity
- Our employees are our most valuable asset.
- Our success is dependent upon the knowledge, imagination, skill, teamwork and integrit of our employees.
- We are committed to our employee's professional and personal development.
- We provide a safe working environment for our employees and protect the environment and communities in which we work.
- We provide quality service.
- We keep 100% of the commitments we make.
- We earn repeat business through our commitment to customer satisfaction.
- We are in business to receive a fair profit for our services.
- We continuously improve the way we conduct business.

Section 2
Safety Responsibilities

Assignment of Responsibilities

Purpose - To provide management, employees, clients, and subcontractors with the Company's guidelines as it pertains to safety and loss control.

The responsibility for the health and safety of our employees rest with the various levels of management. The specific areas of responsibility are as follows:

Company's Responsibilities

1) Provide a program of loss control consistent with good, safe construction practices.

2) Maintain a Safety Department to administer the Company's Safety and Loss Control Programs.

3) Create an attitude of safety consciousness in management, field supervisory personnel, and operating crafts.

4) Charge each manager, superintendent, or other supervisor with his/her personal responsibility for safety loss and control. The senior company representative in residence at, and responsible for, a given project will also be responsible for the implementation and administration of the Company Safety and Loss Control Program.

5) Comply with client programs when required, if provisions of those programs are different than the Company's as long as they are as strict as Doster's.

6) The responsibility for making the Safety and Loss Control Program work is delegated by the corporate president to the various vice presidents, district, area, construction, and project managers, superintendents, and foremen. Making the program work is part of their job responsibilities.

Safety Department Responsibilities

1) Responsibly manage and administer the total Corporate Safety and Loss Control Program.

2) Report directly to Doster Construction Company's President.

3) Visit the field projects and assist project superintendents in following company guidelines in recognizing, evaluating, and controlling the safety and/or industrial hygiene exposures

4) Provide technical assistance and advice to field personnel as needed.

5) Coordinate the efforts of the insurance company's loss control representatives with the efforts of the superintendents.

6) Keep statistical information on accidents, their investigation and costs, and report this information on a periodic basis to company management.

7) Have authority to immediately intervene in a situation where imminent danger or loss of life and/or extreme property damage exist, and where the field management representatives do not agree or refuse to correct the situation. This right of "immediate corrective action" will be used only after careful consideration and with extreme discretion. If field management wishes to protest this decision, the facts must be reviewed by the corporate president and his decision will override that of the Safety Department. Until such time, the Safety Department's recommendation must be followed.

8) Be advised of all OSHA or other regulatory agency inspections and represent the Company in all dealings with either payment of the contesting of such citations, if any.

Project Manager's Responsibilities

1) Monitor the project management staff under his/her supervision to assure the compliance with the Corporate Safety Loss Control Program.

2) Observe construction operations and suggest to the superintendent ways of improving the quality, efficiency, effectiveness, safety, or economy of such construction operations.

3) Act as a liaison between the superintendent and the Safety Department on safety or loss control matters.

4) Seek assistance of the owner if other outside contractors on the project are jeopardizing our Safety and Loss Control Program.

5) Assist in obtaining the cooperation and compliance of subcontractors with our Safety and Loss Control Program. Verify subcontractor programs and request copies of hazardous communication from subcontractors.

Project Superintendent's Responsibilities

1) Be responsible for the overall Safety and Loss Control Program on each project.

2) Be an example to the supervisors and workers in day to day activities to clearly show active support for the Company's Safety Loss and Control Program.

3) Establish a time for weekly tool box meetings.

4) Instruct field supervisors and craft foremen regarding their loss control responsibilities, and make available to them information and equipment applicable to their particular phase of work.

5) Accompany OSHA/Regulatory Compliance Officers and other authorized agency representatives on project compliance reviews if possible and report immediately their visit to the Corporate Safety Director.

6) Never allow workers to short-cut safety for expediency.

7) Detect unsafe acts and conditions on an ongoing basis. (See the Superintendent Weekly Jobsite Safety Checklist attached at the end of this section.) Correct them in a timely manner and monitor employees for compliance with the Company's Safety and Loss Control Program.

8) Provide for the protection of the general public for the duration of the project.

9) Complete accident investigations and review reports with field supervisors and craft foremen and see that corrective action is taken. (See Accident Investigation Procedures and forms under Section 10.)

10) Warn employees of safety violations

11) Follow Company hiring procedure

12) Ensure that employees have received an initial safety orientation and have signed an acknowledgement of the receipt.

Field Supervisor / Craft Foreman's Responsibilities

1) Conduct tool box meetings, submit minutes of the meeting to the superintendent for review.

2) Enforce the safety rules and regulations of the project.

3) See that injuries are cared for and reported immediately and that a drug test is performed using a Company provided test kit available at each jobsite. Assist the superintendent when necessary in the completion of an accident investigation and various accompanying reports.

4) Take corrective action to see the workers commit no unsafe acts and that no unsafe conditions exist in the work area.

5) Take care to see that Doster materials, tools, equipment are used properly and maintained in a safe operating condition.

6) Instruct new employees on working safely at the time they are put to work.

Doster Employee's Responsibilities

1) Work according to good safety practices. (See Section 3, Safety Rules)

2) Report all injuries, no matter how small, to his/her supervisor.

3) Refrain from any unsafe act that might endanger himself/herself or fellow workers.

4) Use safety devices provided for his/her protection.

5) Report any unsafe condition or act to his/her supervisor.

6) Assume his/her share of the responsibility for thoughtlessness or deliberate acts that cause injury to himself/herself or fellow employees.

Subcontractor's Responsibilities

1) Be responsible for the enforcement of safety rules and regulations among their employees and is to designate an individual on each project who is to be responsible for the enforcement of job safety among the subcontractor's employees.

2) Conduct their operations in a safe manner, and in compliance with Doster policies and all applicable Federal, State and local requirements.

3) Abide by the site specific safety rules.

4) Notify all other contractors when their activities could affect the health or safety of other workers.

5) Check in with jobsite supervisor before entering the jobsite.

6) Report all injuries of their workers to Doster's Project Superintendent, regardless of how minor the injuries might be.

Architects', Engineers', Owners', and Visitors' Responsibilities

1) Abide by all safety rules.

2) Inform the project Superintendent before walking through or inspecting the jobsite.

3) Check in with the jobsite management personnel so personal protective equipment, such as hardhats, eye protection, etc. may be provided.

Section 3
Jobsite Safety Rules

The health, welfare and safety of Doster Construction Company, Inc. employees are prime objectives for all our jobs. The following rules and regulations have been selected as a minimum standard only, as they do not cover all hazards you may encounter in the course of your work. They in no way relieve employees of complying with rules and regulations set forth by OSHA and/or any National or Local governing authority. **Work as carefully as possible with the knowledge that each employee is also responsible for his/her own safety.**

A. General Job Safety Rules

1) Before starting work at a Doster Construction Company, Inc. jobsite all employees **must** attend an Employee Orientation. All orientations need to be coordinated with the jobsite superintendent.
2) A job-wide weekly safety meeting with all employees working on the jobsite will be conducted, moderated or directed by the jobsite superintendent **every week** without fail.
3) All accidents and incidents, no matter how minor, **must** be reported to the jobsite superintendent. An accident investigation report must be completed **(by the subcontractor and Doster)** and sent to the Doster Construction Company, Inc. Main Office.
4) Report any unsafe condition to your supervisor or superintendent immediately.
5) Obey all safety warnings.
6) Intoxicating beverages, drugs, and firearms of any kind are not to be brought onto the jobsite and are strictly prohibited.
7) There shall be no fighting, horseplay, practical jokes, or pilferage of any kind.

B. Personal Protective Equipment

8) **Hard hats and eye protection of the proper type must be worn at all times while in the actual construction area.**
9) Suitable clothing, including long trousers and shirts with sleeves (a minimum of 4” in length), proper work shoes, safety glasses, and other types of personal protective equipment necessitated by the work being performed must be used or worn during work hours and maintained in good condition.

C. Fall Prevention, Protection and Planning

10) All employees must be protected from a fall at all times if working above **six feet** form a lower level. Fall protection includes any of the following:
    a. Personal Fall Protection Systems
    b. Guardrails
    c. Safety Nets
11) All employees and subcontractors are required to complete and submit a **Fall Hazard Analysis and Plan** worksheet prior to start operations on a Doster Construction Job Site.
12) All employees associated with elevated work must be training in fall protection/prevention.

D. Housekeeping

13) A general condition of good housekeeping should be maintained at all times.
14) Good housekeeping is to be practiced in storage areas. All materials should be maintained in neat stockpiles for ease of access. Aisles and walkways are to be kept clear of loose materials and tools.
15) Empty containers, papers, or debris of any type should not be allowed to accumulate in areas used by personnel on the jobsite. Trash cans are provided for disposal of debris.
16) **Work areas:** Clean up loose material, waste, etc., immediately. This is especially important in aisles and in the vicinity of ladders, ramps, stairs, machinery, and tools. Any type of loose materials should be removed immediately from any area if a hazard is created.

E. Scaffolding

17) All scaffolds shall be **inspected and tagged** by a competent person before use daily.
18) All work platforms and scaffolds must be equipped with guardrails on all open sides. **Do not move or modify scaffolds with workmen on them**. All floor openings must be safely and securely covered or barricaded with guardrails.
19) Scaffold boards and runways must remain clear at all times.
20) All employees associated with work on scaffolds must be training on the use and hazard identification of scaffolding being used.

F. Excavation and Trenching

21) All excavated material must be kept at least a minimum of two feet from the edge of the excavation.
22) All excavation in excess of four feet in depth must have proper means of access and egress.
23) All excavations in excess of five feet in depth must be safely and properly sloped, shored or protected from possible cave-ins or other failures.

G. Cranes and Rigging

24) All mobile cranes are required to have a current Annual Certification Inspection before starting to operate at a Doster Construction Company jobsite.
25) All crane operators are to be certified by a recognized party (i.e. NCCCO). Certifications must be up to date and are required in Doster Construction Company jobsite files before start of the work.
26) Riding a crane or any other type of hoisting equipment is prohibited. Workers should be raised only in equipment designed to carry personnel. The use of personnel baskets is prohibited at a Doster Construction Company jobsite unless reviewed by the Corporate Safety Director.
27) Critical lifts must have a critical lift plan in writing and be authorized by the Corporate Safety Director and a pre-lift meeting shall take place before the initial lift takes place.
28) Hoisting cables and slings must be inspected on a daily basis or at the start of every shift.

H. Ladders

29) Ladders must be properly constructed and kept in good condition. Damaged ladders should be removed from the work area for replacement as necessitated.
30) Ladders must be the proper length for the job, secured at the top during use, and provided with safety feet if necessary.
31) **DO NOT STAND ON THE TOP OR LAST RUNG OF A LADDER AT ANY TIME.**

I. Electrical and Tools & Equipment

32) **NO ENERGIZED ("HOT") WORK IS ALLOWED ON A DOSTER CONSTRUCTION JOBSITE.**

33) All power panels or closets (temporary or permanent) must be kept closed and secured to avoid the contact with any jobsite personnel.
34) Hand tools and other equipment must be kept in good condition and used only for their intended purpose.
35) All electrical tools and equipment must be used with Ground Fault Circuit Interrupters **(GFCI)** in place.
36) Defective tools should be removed form service; tagged "**Out of Order – Do Not Use**" and given to the supervisor for repair or replacement. The safe condition of all tools on the jobsite, whether company or employee owned, is the responsibility of the Superintendent.
37) All fuel powered and/or electrical equipment should be cut off or disconnected when being lubricated, refueled, repaired, or serviced in any way.
38) Compressed gas cylinders must be maintained in an upright position, secured and capped when not in use and during storage. Oxygen and Acetylene cylinders are to be separated during storage by a distance of twenty (20) feet or by barrier at least five (5) feet high having at least one half hour fire resistance rating.
39) Be alert for fires and be familiar with location and proper operating procedures of fire extinguishers.

Section 4
Disciplinary Program

Each employee (or subcontractor) who fails to comply with Doster Construction Company safety rules and regulations will be subject to disciplinary action and possible termination.

Verbal Warning

Doster's disciplinary program starts with a verbal warning which is provided to all employees and subcontractors at the time of the video orientation where basic safety rules and regulations are outlined. The employee orientation is given before the personnel starts to perform any work at the jobsite.

Written Warning

The disciplinary program continues with written warnings which are documented on the Safety Violation Ticket. Written warnings are handed to employees who violate safety rules and regulations and their severity vary with the level of the infraction (I, II or III). Safety Violation Tickets will outline the nature of the offense and the necessary corrective action that is required by the employee(s).

Levels are outlined as follows:

Level I Infraction – Minor infraction, non-life threatening that will require a written ticket but no dismissal from project.
Example of Level I Infractions:

- Personal Protective Equipment (PPE) violation.
- Evidence of no equipment and/or PPE inspection.
- Ladder usage
- Housekeeping
- Equipment usage (lack of seatbelts, machine guarding, grounding, misuse of scaffolds, etc.)
- Electrical violation such as electrical cord damaged and used, lack of grounding, ratings, etc.
    - No locks on electrical energized equipment or boxes.
- No means of egress and access (i.e. scaffolds, excavations, etc.).

Level II Infraction – Mid level infraction that could cause a serious injury not life threatening and that will require a written ticket and dismissal from the job for a period of three working days.
Example of Level II Infractions:

- Level I Infraction repeat by the same employee(s)
- Unauthorized use of equipment (i.e. no training documentation for equipment use)
- Unauthorized use of material (i.e. non electrician handling energized equipment)
- Disregard for signage posted for personal safety or coordination (i.e. crossing red "DANGER" signs or tape without prior authorization)

- Evidence of lack of training where training is required for both equipment and PPE usage.
- Multiple infraction on the same issue or multiple Level I infractions for the same employee or group of employees.

***Level III Infraction* – (If the Safety Violation Ticket, including corrective instruction, does not encourage the employee to adhere to the safety rules, termination is the final step)**. Serious infraction with a life threatening characteristic; it will require a written ticket with the permanent dismissal from the project and from any other Doster Construction Company project. Example of Level III Infractions:

- Evident employee disregard or negligence towards safety rules and regulations.
- Permanent repeat of a Level I Infraction.
- Any repeat for Level II Infraction.
- Lack of fall protection (Personal systems, guardrails or safety nets).

Section 5
Substance Abuse Policy

Purpose

Doster Construction Company, Inc. maintains a Drug and Alcohol Policy to help guarantee our employees, contractors, and customers a safe and drug-free workplace and business environment. Even off-duty drug use can affect your performance and the safety of others. Our policy is designed to comply with all applicable federal and state laws and regulations concerning testing, and with the demands of our customers who require us to drug test.

Reporting

An employee convicted under any federal or state criminal drug statute for a violation occurring while on duty must notify the Safety Director, or in his absence the President, of the conviction no later than five calendar days after the conviction.

Drugs

Doster Construction Company, Inc. as a condition of initial and continued employment, requires all employees to report to work and perform their duties without any unlawful or mind altering drugs in their system. We also will not tolerate employees using, possessing, manufacturing, distributing or making arrangements to distribute unlawfully used drugs while at work or on Company or project property, including vehicles. We prohibit outside conduct which is unlawful, or affects your work, our relationship with the government or our customers, or reflects badly on the Company. Although properly using medication is not prohibited, you must consult with your supervisor or Company Physician/Medical Review Officer (“MRO") when you are legitimately taking medication which may affect your work. You must maintain any prescription medication in the original container labeled with the name of the employee and the prescribing physician.

Alcohol

Employees shall not consume or possess alcohol during work hours, including at lunch or breaks, or while on Company or project property. Employees under the influence of alcohol while on duty, or on Company or project property, will be subject to discipline, including discharge. An employee who tests positive for alcohol while on duty or on Company or project property will be presumed to have violated this rule. Under no circumstances may an employee operate a Company or personal vehicle during or while leaving work or a Company function while under the influence of alcohol.

Testing

We reserve the right to require all applicants to undergo drug and alcohol tests and will disqualify them if positive results are received before hire, or discharge them if positive results are received after hire. All employees will be subject to drug and alcohol testing under the following circumstances:

1) When involved in a job-related accident which in the discretion of Management caused or could have caused recordable injury or property damage;

2) Where the Company has reasonable cause to believe that an employee has violated its Drug and Alcohol Policy;

3) As part of a “random” system of periodically testing employees without advance notice;

4) Upon return from a leave or lay-off;

5) When required to do so by our customers; and

6) As part of any rehabilitation/probation program.

Employees who operate vehicles on the streets which weigh in excess of 26,000 pounds will also be tested as required by the Federal Highway Administration and State Motor Carrier Safety Regulations, including at recertification physical examinations. Alcohol testing will be done where required by law or as part of post-accident, reasonable cause testing, or rehabilitation-related testing.

Awareness Program

To educate our employees concerning the dangers associated with using illegal drugs, Doster Construction Company, Inc. will conduct periodic informational meetings with employees, will maintain a selection of educational materials concerning drug abuse, and will maintain a list of local drug counseling, rehabilitation and employee assistance programs. Any employee interested in reviewing these materials should contact the Safety Director, or in his absence the President. All requests for information will be kept strictly confidential.

Searches

We reserve the right to search, at any time, desks, cabinets, tool boxes, vehicles, including personal vehicles brought on Company or project property, bags, purses, lunch boxes, or any other property at the Company, a project site, or in vehicles, with or without notice.

Discipline

Violation of these rules, including testing positive, will subject employees to discipline, including discharge. Refusal to cooperate with the Company in any test, including refusal to submit to such test, search or investigation will result in discipline, including discharge. Refusal to cooperate in any test required by the Company after an on-the-job accident will also result in the loss of entitlement to workers' compensation benefits, as well as in discipline, which may include discharge.

Any employee who violates this policy (or who is convicted of a violation of a federal or state criminal drug statue for a violation occurring while on duty), in the sole discretion of Doster, may be required to satisfactorily complete a drug or alcohol abuse counseling, assistance or rehabilitation program as a condition of continued employment or reemployment. An employee whose continued employment is conditioned on the satisfactory completion of a counseling, assistance or rehabilitation program will be referred to a local program. The cost of any counseling, assistance or rehabilitation program will be the responsibility of the employee and no provision in the policy should be construed to obligate Doster Construction Company, Inc., to bear the cost of any such program to which an employee may be referred.

Rehabilitation

Anyone who needs help for drug or alcohol problems should immediately seek assistance and quit abusing drugs and alcohol before he or she is caught in violation of the policy. Any questions should be directed to the Safety Director, or in his absence the President. Seeking or enrolling in a rehabilitation program does not exempt an employee from disciplinary action.

Section 6
Orientation/Training

Doster Construction Company, Inc. maintains a policy of fair employment practices without regard to race, religion, national origin, or sex. Therefore, all positions shall be filled by the most qualified applicants with regard only to the requirements of the position.

Application Process

Every employee of Doster if to complete, sign, and date an employee packet prior to being hired as follows:

1) Employee Orientation

    1.1 Every new employee is to receive a project orientation consisting of both verbal and written information. This is to cover both project and safety rules and regulations.
    1.2 The employee is to receive a copy of the basic project safety rules on the employee's date of hire. A copy of the employees receipt is to be kept in the employee's personnel file on site and a copy forwarded to Doster's Corporate Office.
    1.3 Explain arrangements and procedures for treatment of injuries and the requirements of immediately reporting all injuries

2) Basic Safety Rules

3) Jobsite Application for Employment

    3.1. Keep regardless of whether or not employee is hired.
    3.2. **The minimum age of employment is eighteen (18) years old.**

4) Drug & Alcohol Policy

5) W-4

6) A-4 (will vary according to job location)

7) I-9

8) Hazardous Materials Training Form upon completion of HazCom training prior to actual work activities.

9) Crane operator's Qualification and Operation Guidelines and Crane Operator's Safety Checklist. (These forms are required to be signed by any employee hired as a crane operator or any employee whose job responsibilities change and which require him or her to operate a crane before they operate a crane.) Any employee hired to operate a crane must undergo a physical examination by a company designated physician.

10) Any employee who can reasonably be expected to operate a Doster vehicle on behalf to Doster should supply a copy of his/her valid driver's license.

Orientation Information

During the first ninety (90) days of work with Doster, new employees undergo a probationary period. During this time, work habits are closely monitored.

Normal working hours are 7:00 a.m. until 3:30 p.m., Monday through Friday, with a thirty (30) minute lunch break. The job superintendent may change these hours as indicated by jobsite conditions.

Employees are expected to report to work on time and be on time. If you are ill, have a special problem, or an emergency and cannot report to work, you are expected to notify the jobsite office as early as possible. Frequent tardiness, absenteeism, or failure to call in may result in disciplinary actions up to and including termination of employment.

Our pay period runs Monday through Sunday with pay day on Friday of the following week. Draws or advances on your pay are against company policy and should not be requested.

If something about the job is bothers an employee, he/she should report the problem to his/her supervisor. If the problem cannot be solved by the supervisor, or is not settled, the employee should report to the job superintendent. REGISTERING A COMPLAINT WILL NOT RESUT IN DISCIPLINARY ACTION AGAINST THE EMPLOYEE.

Employee honesty, appearance, behavior, and performance reflect our Company's image to our customers.

The following list of rules are necessary to ensure the equal treatment of our employees an to provide a safe working environment:

1) Fighting and horseplay, use of illegal drugs or the drinking of alcoholic beverages on the job, possession of firearms, insubordination to a supervisor, or any other conduct detrimental to good work performance and harmony on the job will be cause for termination.

2) Employees will be required to report to work wearing the proper clothing and work shoes suitable for a construction site. Appropriate clothing includes normal long trousers, shirts with sleeves and sturdy work shoes or boots. **No short tank tops will be allowed**.

3) Employees must report all injuries, NO MATTER HOW SMALL, to their foreman AT THE TIME THEY OCCUR.

4) Employees are to observe and practice good housekeeping on this project.

5) Solicitation or distribution of any non-job related material is prohibited on Company property.

6) Understand how to do your job properly. If you do not understand, contact your supervisor.

7) Policy Against Harassment of any kind.

Section 7
Safety Meeting - Requirements

On each and every Doster Construction Company project, it is the assigned job Superintendent's responsibility to conduct, or direct, a weekly site-wide Safety Meeting, without fail.

The topic of this meeting will be determined by the Superintendent based on site safety need, or site loss trending. At least once a month (one week out of the month), the jobsite weekly safety topic will be focused on Hazard Material Communication and MSDS following the guidelines on Section 17 – Hazard Communication Program on this manual. Periodically, the topic of this meeting may also be in the form of a dispatch from the Company Safety Department, based on immediate Company wide safety needs.

This all-personnel 'attendance required' weekly safety meeting will include each Doster Construction Company worker, and all subcontractor, or Managed GC, personnel. There are no exceptions for all site workers to attend this meeting. Failure to attend will result in removal from the project.

A sign-in roster, and topic description sheet, will be maintained in the site safety record files. This data will be made available to Company safety management, upper management, and to any OSHA Field Officer upon request.

Section 8
Emergency Response / Action Plan

Introduction

The Contingency Plan and Emergency Procedures described herein details the actions to be taken by all responding personnel to potential situations at Doster Construction Company that pose real or potential threats to human health and the environment.

This document must be reviewed, in conjunction with the Crisis Management Plan and the Environmental Management System documents and with all individuals responsible for the response to emergency situations. Actions taken at the time of an emergency must be taken quickly but must be consistent with this plan.

This plan, while detailed, is at best only a guide. Every emergency is unique and requires unique response.

Emergency Coordinator

The Emergency Coordinator as described here in this section shall be the jobsite superintendent in charge or any designee appointed by him, i.e. Assistant Superintendent or On-site Safety Manager.

Spills or Leaks

A spill is defined as an unexpected release of any hazardous material from a container.

1. For operational purposes, spills of any hazardous material will be divided into two levels: Spills which can be contained with Onsite Emergency Spill Kit and those that cannot be contained by jobsite means.

A leak is a release from a container via a puncture or weak spot in the container. Leaks are also divided into two levels: slow leaks of less than 1 gallon, resulting in slow discharge of a material and major leaks, such as from container puncture, resulting in rapid discharge of more than 1 gallon of material.

An uncontrolled leak can result in a spill.

Reportable Spills

Any spill or slow leak must be reported to the Emergency Coordinator.

Any spill or leak that can be contained by the On-site Emergency Spill Kit may be cleaned up by the responding employee at his discretion under the supervision of the Emergency Coordinator, following instructions outlined in the appropriate MSDS sheet.

Any spill or leak that cannot be contained by the On-site Emergency Spill Kit shall be notified to the Corporate Safety Director, which in coordination with the Emergency Coordinator will notify the spill or leak to a third party environmental remediation contractor for control and appropriate disposal. If the spill involves a hazardous material, all employees must leave the immediate area until the problem is corrected and safe conditions exist. All MSDS for material involved in a spill or leak shall be readily available.

All spills or leaks which cannot be controlled by the On-site Emergency Spill Kit will be logged by the Corporate Safety Director using the Accident/ Incident Report Form.

On-site Emergency Spill Kit

All Doster Construction Company jobsites shall have readily available an On-site Emergency Spill Kit containing not less than the following materials:

1. 5 Gallon Bucket
2. Absorbent Material
3. 1 Box of 6 Mil disposable bags
4. 2 Pairs of Safety Goggles
5. 1 Box of Disposable gloves
6. 1 Box of Disposable Dust Mask N95 (minimum)
7. Shovel

Fighting a Spill or Leak (using the On-site Emergency Spill Kit)

Leave the immediate area while donning appropriate personal protection equipment—eye, face, hand, and respiratory equipment—as advised on the MSDS. If the spill is of reportable size do not re-enter the contaminated area until an Emergency Coordinator arrives.

1. Identify the spilled material (MSDS) and if possible, remove any documentation from the spilled container to a safe place.

2. Select appropriate spill-fighting equipment and agents (MSDS).

3. Contain the spill by diking with appropriate material (MSDS).

4. Absorb all free liquid.

5. Follow any instructions (MSDS) for the neutralization or detoxification of any hazardous spilled materials.

6. Place all spilled materials into an appropriate container.

7. Thoroughly decontaminate the area.

8. Clean, repair, and recondition all emergency response equipment.

An Emergency Coordinator must certify the area before it is returned to normal use.

All spills and details of the cleanup operation must be noted and filed on the Superintendent Daily Report.

Responsibility of Emergency Coordinators

The duties of Emergency Coordinators responding to spills or leaks include, but are not limited to:

1. Make certain all personnel working at the facility are aware of the emergency and removed to a safe location.

2. Notify and request needed assistance.

3. Identify the chemical nature of the spill or leak (MSDS).

4. Assess possible danger to human health and the environment.

5. Take appropriate measures to correct the condition and return to a safe condition.

If a danger to health or the environment exists, the Emergency Coordinator must:

1 Notify the Corporate Safety Director and coordinate notification to the appropriate local authorities as dictated by the nature of the situation or danger. Implement Doster Construction Company's Crisis Management Plan.

2 In conjunction with appropriate local authorities decide if evacuation is necessary. If a real and present danger exists, evacuate the facility immediately.

3 If the spill or leak is of a serious nature, contact the National Response Center, 800-424-8802, and give the following information:

3.1 Name and phone number

3.2 Name and address of company

3.3 Time and type of incident

3.4 Name and quantity of material involved

3.5 Possible hazard to health of the environment outside the facility.

4 During resolution of the emergency, the Emergency Coordinator must take all reasonable measures to limit the extent of the threat.

5 The Emergency Coordinator must assure all cleanup and decontamination procedures are performed consistent with instructions, procedures, and information available.

Fire and Explosion

In case of fire or explosion, turn on the alarm before attempting any other action.

If the fire can be fought with extinguishers, do so. Otherwise, notify Corporate Safety Director and start the implementation of Doster Construction Company's Crisis Management Plan, leave the area immediately.

Whenever a fire or explosion threatens, the Emergency Coordinator(s) will leave the control of the situation to the most qualified firefighter available and will provide chemical and safety advice as he or she may be able to acquire from MSDS or other sources.

During a fire or explosion emergency, the staff of the facility, in general, and the Emergency Coordinator are responsible to provide information to the firefighters.

After the fire is out, the area must be carefully checked for any chemical hazards and decontaminated if necessary. The Emergency Coordinator is responsible to ensure the extent of the threat is limited and cleanup and decontamination procedures are followed in a consistent manner.

Personal Injury/Illness

Any injury or illness shall be notified and reported to the Corporate Safety Director.

If an injury, involving a hazardous material occurs, the Emergency Coordinator must be notified. The victim is to be taken to the nearest hospital. The following information must be sent with the victim.

1) Identity of hazardous material and the MSDS sheet.

2) Estimated quantity of material involved in the incident.

3) Time and location of the incident.

The Emergency Coordinator will assist the hospital staff with information concerning the material involved and its hazards.

The Emergency Coordinator is required to perform a complete inspection of the facility to ensure that the accident resulting in the personal injury has not created a situation which would result in further harm to human health and/or the environment. Any such situation must be immediately resolved.

If an employee becomes ill as a result of acute or chronic exposure to a hazardous material, he/she must be removed from the job for the duration of the illness. All appropriate medial help must be obtained, including consultation with an Industrial Hygienist and Toxicologist.

Other Emergencies

Any situation, which in the opinion of an employee of the facility, poses a potential threat to human health and/or the environment, must be reported to the Emergency Coordinator. The Emergency Coordinator and Corporate Safety Director are responsible for decisions to declare an emergency and implement the Crisis Management Plan.

Resumption of Operations

In the event of a major emergency which requires normal operations to be disrupted, the Emergency Coordinator must insure:

1) All cleanup and decontamination procedures have been carried out and no hazardous conditions exist.

2) All emergency equipment used during the emergency is cleaned and fit for use.

3) Contact Corporate Safety Director for final verification and approval for resumption of operations.

Section 9
First Aid Responders

Medical Surveillance

Before work begins on a construction site, the (site superintendent) will ensure the medical availability of medical personnel for advice, consultation, and treatment of medical emergencies.

Any employee, acting as a designated first aid responder or as a Good Samaritan by rendering emergency first aid care, will receive appropriate follow-up medical treatment by a licensed healthcare provider immediately after exposure.

Treatment and Travel Time

On all of our jobsites there will always be a designated and trained First Aid Responder at all times. The First Aid Responder will be trained in administering First Aid and CPR. Where a medical facility is near the worksite, the employer will insure the following:

1. In areas where accidents resulting in severe or life threatening injuries or illnesses, such as suffocation, severe bleeding or electrocution, could occur, a **3 to 4 minute response time** by emergency response personnel is required.

Training

Designated first aid responders will have a current first aid and CPR card in order to render first aid. The training must be from the American Heart Association, the American Red Cross, or equivalent and will be documented.
Additionally, the designated first aid responders will be trained in bloodborne pathogens (such as hepatitis, HIV, malaria, etc.)

Supplies Standard and Restocking Procedure

First aid supplies will be available on each jobsite with supplies approved by the consulting physician. The minimum required size kit for each jobsite will be a 50 person kit. First aid supplies will include but is not limited to disposable gloves, disposable mouthpieces for CPR, and eye protection. The supplies will be checked out by the site superintendent before being sent out on each job and at least monthly on each job to make sure expired items are replaced and restocked.

Posting Emergency Numbers

The telephone numbers of doctors, hospitals, clinics, and ambulances will be posted where they are noticeable to all employees. For example:

EMERGENCY – 911
DOCTOR –
HOSPITAL –
CLINIC(S) –
AMBULANCE –

First Aid and Emergency Medical Response Requirements

1. The general rule for Doster Construction Company is to have a First Aid Responder on site at all times. The responder needs to be trained in administering First Aid and CPR.

2. The designated first aid responders will have a current first aid and CPR card. A 50 person First Aid kit is a requirement as a minimum of the jobsite.

3. Additionally, designated first aid responders will be trained in bloodborne pathogens (such as hepatitis, HIV, malaria, etc.)

4. Employees responding as Good Samaritans (not designated first aid responders) and rendering emergency first aid care will receive follow-up medical care by a licensed healthcare provider immediately after exposure.

5. The project manager needs to make provisions BEFORE the project starts, on how they will provide prompt medical attention in case of a serious injury. This includes but is not limited to contacting local authorities (Fire and Rescue Department, local Fire Department, etc.) to establish first/direct lines of communication and introduction.

Section 10
Accident Investigation Procedure

Introduction

Accidents occur when hazards escape detection during preventive measures, such as a job or process safety analysis, when hazards are not obvious, or as the result of combinations of circumstances that were difficult to foresee. A thorough accident investigation may identify previously overlooked physical, environmental, or process hazards, the need for new or more extensive safety training, or unsafe work practices. The primary focus of any accident investigation should be the determination of the facts surrounding the incident and the lessons that can be learned to prevent future similar occurrences.

Scope and Application

All accidents should be investigated. The depth and complexity of the investigation will vary with the circumstances and seriousness of the accident. The Superintendent or other individual responsible for operations involved in an accident should ensure that an investigation is conducted and that when appropriate, corrective actions are taken.

Program Description

The first priority whenever an accident occurs is to deal with the emergency and ensure that any injuries or illnesses receive prompt medical attention. **Immediately after the accident occurs, Superintendents must notify the Safety Director**. If the Safety Director is not available, notify the President.

	Office Phone	Mobile Phone
Safety Director-Ron Covo	205-443-3830	205-281-2274
President-Walton Doster	205-443-3869	205-229-7882

The accident investigation should begin immediately thereafter. This ensures that details of what occurred will be fresh in people's minds and that witnesses don't influence one another by talking about the accident. It also minimizes the likelihood that important evidence is not moved, lost, taken, destroyed, or thrown away before the scene has been thoroughly inspected.

Types of Accidents

Accidents fall into two categories, serious and non-serious.
Non-serious accidents do not cause lost workdays even though the worst that could happen did happen. These accidents are treated at the jobsite with the onsite First Aid kit and do not require further medical treatment. Examples of these include paper cuts, minor scratches or abrasions, or system failures that have minor consequences, such as a low-pressure hose that ruptures and sprays cool water.
Serious accidents include both those which did involve lost workdays and those which might have.
This second type of serious accident is called a "**near miss**." Some near miss accidents can be treated at the jobsite with the onsite First Aid kit and do not require further medical treatment. The onsite Superintendent will determine the nature of the accident.

Examples of near misses with serious injury potential include:

1) A worker twists an ankle in a fall from a low scaffold (this could easily have been a broken leg or worse)

2) A worker tips back in a chair and topples backward (backward falls are always serious because head injury might result)

3) A worker turns on a machine and gets a slight shock (shock from voltage potential greater than 75 volts DC or 40 volts AC is considered serious).

After an accident or near miss occurs, supervisors should determine what level of investigation is needed. All serious accidents, those involving lost workdays or near misses, should be investigated with the same thoroughness.

Who Should Investigate

Superintendents should make their own initial investigation of all accidents, using the **DOSTER FORM "Accident Investigation Report"**. When circumstances warrant (e.g. complex technical issues, chemical exposures, serious injury) a more comprehensive investigation involving other staff members, the Corporate Safety Department, or other, Legal Council, Risk Management, etc.) may be conducted.

Regardless of the type of investigation, the supervisor should be involved for the following reasons:

1) Superintendents have a responsibility to provide their workers with a safe and healthful workplace

2) Superintendents know the workers and their work better than anyone else and are in the best position to gather the facts and find a practical solution to the problem

3) The superintendent's accident investigation can help promote better relations with workers by demonstrating concern for their safety and attention to accident prevention.

How to Investigate

As with most other tasks, skill in conducting effective accident investigations improves with experience. A good basic approach is to find out what caused the accident and what can be done to prevent or minimize the chances of a similar accident occurring. Some suggestions that may help superintendents or other supervisors get the facts and reach a conclusion include:

1) Maintain objectivity throughout the investigation. Its purpose is to find the cause of the accident, not to assign blame for its occurrence.

2) Check the accident site and circumstances thoroughly before anything is changed.

3) Discuss the accident with the injured person, but only after first aid or medical treatment has been given. Also talk with anyone who witnessed the accident and those familiar with conditions immediately before and after it occurred.

4) Be thorough. Small details may point to the real cause.

5) Reconstruct the events that resulted in the accident, considering all possible causes. Determine unsafe conditions or actions that separately or in combination were contributing factors.

6) <u>If help is needed in determining the cause, ask for it. Your Project Safety Manager can provide assistance with accident investigations.</u>

What to Do With the Results

Superintendents should take action to control or eliminate the conditions that caused the accident once these have been conclusively identified. All accidents and near misses are required to be investigated. Reports are sent to the corporate office for filing and tracking for future learning processes.

The Safety Department can provide assistance in determining the level of action that may be necessary, such as the following:

1) When equipment changes or safeguards are necessary, superintendents should discuss specific recommendations with upper management

2) When an operation can be changed to eliminate the hazard, superintendents should make the change if it is within their authority, or seek the necessary approval from upper management

3) If unsafe acts by workers are involved, ensure that the worker is properly trained and that training is followed. All others involved in similar operations should be trained as well.

Roles and Responsibilities

1) Field Operations
   - 1.1 Ensure accidents involving their operations or workers are investigated.
   - 1.2 Ensure corrective actions are taken to prevent re-occurring accidents.

2) Superintendents or other supervisors
   - 2.1 Investigate incidents promptly and thoroughly.
   - 2.2 Call the accident in to the Safety Director
   - 2.3 Call your Project Safety Manager for assistance when needed.
   - 2.4 Take corrective actions to prevent re-occurring accidents.

3) Project Safety Managers
   - 3.1 Assist supervisors with investigations when requested.
   - 3.2 Provide training in investigation methods and techniques.

4) Individual
   4.1 Cooperate with supervisors and others during investigations.

* **The attached Doster Construction Company Accident/Incident Investigation Report should be used for all investigations, and can also be found in "Safety Forms" on the Doster HR Website.**

* **All completed Accident Investigation Reports are required to be sent to the corporate office "Attention Safety Department" for archiving and tracking.**

Section 11
OSHA Record Keeping Requirements (OSHA 300)

General recording Criteria

Basic Requirement

You must consider an injury or illness to meet the general recording criteria, and therefore to be recordable, if it results in any of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness. You must also consider a case to meet the general recording criteria if it involves a significant injury or illness diagnosed by a physician or other licensed health care professional, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid, or loss of consciousness.

Implementation

1. **How do I record a work-related injury or illness that results in the employee's death?**
   You must record an injury or illness that results in death by entering a check mark on the OSHA 300 Log in the space for cases resulting in death.

2. **How do I record a work-related injury or illness that results in days away from work?**
   When an injury or illness involves one or more days away from work, you must record the injury or illness on the OSHA 300 Log with a check mark in the space for cases involving days away and an entry of the number of calendar days away from work in the number of days column. If the employee is out for an extended period of time, you must enter an estimate of the days that the employee will be away, and update the day count when the actual number of days is known.

3. **Do I count the day on which the injury occurred or the illness began?**
   No, you begin counting days away on the day after the injury occurred or the illness began.

4. **How do I record an injury or illness when a physician or other licensed health care professional recommends that the worker stay at home but the employee comes to work anyway?**
   You must record these injuries and illnesses on the OSHA 300 Log using the check box for cases with days away from work and enter the number of calendar days away recommended by the physician or other licensed health care professional. If a physician or other licensed health care professional recommends days away, you should encourage your employee to follow that recommendation. However, the days away must be recorded whether the injured or ill employee follows the physician or licensed health care professional's recommendation or not. If you receive recommendations from two or more physicians or other licensed health care professionals, you may make a decision as to which recommendation is the most authoritative, and record the case based upon that recommendation.

5. **How do I handle a case when a physician or other licensed health care professional recommends that the worker return to work but the employee stays at home anyway?**
   In this situation, you must end the count of days away from work on the date the physician or other licensed health care professional recommends that the employee return to work.

6. **How do I count weekends, holidays, or other days the employee would not have worked anyway?**
   You must count the number of calendar days the employee was unable to work as a result of the injury or illness, regardless of whether or not the employee was scheduled to work on those day(s). Weekend days, holidays, vacation days or other days off are included in the total number of days recorded if the employee would not have been able to work on those days because of a work-related injury or illness.

7. **How do I record a case in which a worker is injured or becomes ill on a Friday and reports to work on a Monday, and was not scheduled to work on the weekend?**
   You need to record this case only if you receive information from a physician or other licensed health care professional indicating that the employee should not have worked, or should have performed only restricted work, during the weekend. If so, you must record the injury or illness as a case with days away from work or restricted work, and enter the day counts, as appropriate.

8. **How do I record a case in which a worker is injured or becomes ill on the day before scheduled time off such as a holiday, a planned vacation, or a temporary plant closing?**
   You need to record a case of this type only if you receive information from a physician or other licensed health care professional indicating that the employee should not have worked, or should have performed only restricted work, during the scheduled time off. If so, you must record the injury or illness as a case with days away from work or restricted work, and enter the day counts, as appropriate.

9. **Is there a limit to the number of days away from work I must count?**
   Yes, you may "cap" the total days away at 180 calendar days. You are not required to keep track of the number of calendar days away from work if the injury or illness resulted in more than 180 calendar days away from work and/or days of job transfer or restriction. In such a case, entering 180 in the total days away column will be considered adequate.

10. **May I stop counting days if an employee who is away from work because of an injury or illness retires or leaves my company?**
    Yes, if the employee leaves your company for some reason unrelated to the injury or illness, such as retirement, a plant closing, or to take another job, you may stop counting days away from work or days of restriction/job transfer. If the employee leaves your company because of the injury or illness, you must estimate the total number of days away or days of restriction/job transfer and enter the day count on the 300 Log.

11. **If a case occurs in one year but results in days away during the next calendar year, do I record the case in both years?**
    No, you only record the injury or illness once. You must enter the number of calendar days away for the injury or illness on the OSHA 300 Log for the year in which the injury or Illness occurred. If the employee is still away from work because of the injury or illness when you prepare the annual summary, estimate the total number of calendar days you expect the employee to be away from work, use this number to calculate the total for the annual summary, and then update the initial log entry later when the day count is known or reaches the 180-day cap.

12. **How do I record a work-related injury or illness that results in restricted work or job transfer?**
When an injury or illness involves restricted work or job transfer but does not involve death or days away from work, you must record the injury or illness on the OSHA 300 Log by placing a check mark in the space for job transfer or restriction and an entry of the number of restricted or transferred days in the restricted workdays column.

13. **How do I decide if the injury or illness resulted in restricted work?**
Restricted work occurs when, as the result of a work-related injury or illness:

13.1.1. You keep the employee from performing one or more of the routine functions of his or her job, or from working the full workday that he or she would otherwise have been scheduled to work; or

13.1.2. A physician or other licensed health care professional recommends that the employee not perform one or more of the routine functions of his or her job, or not work the full workday that he or she would otherwise have been scheduled to work.

14. **What is meant by "routine functions"?**
For recordkeeping purposes, an employee's routine functions are those work activities the employee regularly performs at least once per week.

15. **Do I have to record restricted work or job transfer if it applies only to the day on which the injury occurred or the illness began?**
No, you do not have to record restricted work or job transfers if you, or the physician or other licensed health care professional, impose the restriction or transfer only for the day on which the injury occurred or the illness began.

16. **If you or a physician or other licensed health care professional recommends a work restriction, is the injury or illness automatically recordable as a "restricted work" case?**
No, a recommended work restriction is recordable only if it affects one or more of the employee's routine job functions. To determine whether this is the case, you must evaluate the restriction in light of the routine functions of the injured or ill employee's job. If the restriction from you or the physician or other licensed health care professional keeps the employee from performing one or more of his or her routine job functions, or from working the full workday the injured or ill employee would otherwise have worked, the employee's work has been restricted and you must record the case.

17. **How do I record a case where the worker works only for a partial work shift because of a work-related injury or illness?**
    A partial day of work is recorded as a day of job transfer or restriction for recordkeeping purposes, except for the day on which the injury occurred or the illness began.

18. **If the injured or ill worker produces fewer goods or services than he or she would have produced prior to the injury or illness but otherwise performs all of the routine functions of his or her work, is the case considered a restricted work case?**
    No, the case is considered restricted work only if the worker does not perform all of the routine functions of his or her job or does not work the full shift that he or she would otherwise have worked.

19. **How do I handle vague restrictions from a physician or other licensed health care professional, such as that the employee engage only in "light duty" or "take it easy for a week"?**
    If you are not clear about the physician or other licensed health care professional's recommendation, you may ask that person whether the employee can do all of his or her routine job functions and work all of his or her normally assigned work shift. If the answer to both of these questions is "Yes," then the case does not involve a work restriction and does not have to be recorded as such. If the answer to one or both of these questions is "No," the case involves restricted work and must be recorded as a restricted work case. If you are unable to obtain this additional information from the physician or other licensed health care professional who recommended the restriction, record the injury or illness as a case involving restricted work.

20. **What do I do if a physician or other licensed health care professional recommends a job restriction meeting OSHA's definition, but the employee does all of his or her routine job functions anyway?**
    You must record the injury or illness on the OSHA 300 Log as a restricted work case. If a physician or other licensed health care professional recommends a job restriction, you should ensure that the employee complies with that restriction. If you receive recommendations from two or more physicians or other licensed health care professionals, you may make a decision as to which recommendation is the most authoritative, and record the case based upon that recommendation.

21. **How do I decide if an injury or illness involved a transfer to another job?**
    If you assign an injured or ill employee to a job other than his or her regular job for part of the day, the case involves transfer to another job. Note: This does not include the day on which the injury or illness occurred.

22. **Are transfers to another job recorded in the same way as restricted work cases?**
    Yes, both job transfer and restricted work cases are recorded in the same box on the OSHA 300 Log. For example, if you assign, or a physician or other licensed health care professional recommends that you assign, an injured or ill worker to his or her routine job duties for part of the day and to another job for the rest of the day, the injury or illness involves a job transfer. You must record an injury or illness that involves a job transfer by placing a check in the box for job transfer.

23. **How do I count days of job transfer or restriction?**
    You count days of job transfer or restriction in the same way you count days away from work. The only difference is that, if you permanently assign the injured or ill employee to a job that has been modified or permanently changed in a manner that eliminates the routine functions the employee was restricted from performing, you may stop the day count when the modification or change is made permanent. You must count at least one day of restricted work or job transfer for such cases.

24. **How do I record an injury or illness that involves medical treatment beyond first aid?**
    If a work-related injury or illness results in medical treatment beyond first aid, you must record it on the OSHA 300 Log. If the injury or illness did not involve death, one or more days away from work, one or more days of restricted work, or one or more days of job transfer, you enter a check mark in the box for cases where the employee received medical treatment but remained at work and was not transferred or restricted.

25. ***What is the definition of medical treatment?***
    "Medical treatment" means the management and care of a patient to combat disease or disorder.

    Medical treatment does not include:

    25.1 Visits to a physician or other licensed health care professional solely for observation or counseling;

25.2 The conduct of diagnostic procedures, such as x-rays and blood tests, including the administration of prescription medications used solely for diagnostic purposes (*e.g.*, eye drops to dilate pupils); or

25.3 "First aid" as defined in number 26 of this section.

26 ***What is "first aid"?***

First aid" means the following:

26.1 Using a non-prescription medication at nonprescription strength (for medications available in both prescription and non-prescription form, a recommendation by a physician or other licensed health care professional to use a non-prescription medication at prescription strength is considered medical treatment for recordkeeping purposes);

26.2 Administering tetanus immunizations (other immunizations, such as Hepatitis B vaccine or rabies vaccine, are considered medical treatment);

26.3 Cleaning, flushing or soaking wounds on the surface of the skin;

26.4 Using wound coverings such as bandages, Band-Aids™, gauze pads, etc.; or using butterfly bandages or Steri-Strips™ (other wound closing devices such as sutures, staples, etc., are considered medical treatment);

26.5 Using hot or cold therapy;

26.6 Using any non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc. (devices with rigid stays or other systems designed to immobilize parts of the body are considered medical treatment for recordkeeping purposes);

26.7 Using temporary immobilization devices while transporting an accident victim (***e.g.***, splints, slings, neck collars, back boards, etc.).

26.8 Drilling of a fingernail or toenail to relieve pressure, or draining fluid from a blister;

26.9 Using eye patches;

26.10 Removing foreign bodies from the eye using only irrigation or a cotton swab;

26.11 Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means

26.12 Sing finger guards;

26.13 Sing massages (physical therapy or chiropractic treatment are considered medical treatment for recordkeeping purposes); or

26.14 Drinking fluids for relief of heat stress.

27 **Are any other procedures included in first aid?**
No, this is a complete list of all treatments considered first aid.

28 **Does the professional status of the person providing the treatment have any effect on what is considered first aid or medical treatment?**
No, OSHA considers the treatments listed to be first aid regardless of the professional status of the person providing the treatment. Even when these treatments are provided by a physician or other licensed health care professional, they are considered first aid for these purposes. Similarly, OSHA considers treatment beyond first aid to be medical treatment even when it is provided by someone other than a physician or other licensed health care professional.

29 **What if a physician or other licensed health care professional recommends medical treatment but the employee does not follow the recommendation?**
If a physician or other licensed health care professional recommends medical treatment, you should encourage the injured or ill employee to follow that recommendation. However, you must record the case even if the injured or ill employee does not follow the physician or other licensed health care professional's recommendation.

30 **Is every work-related injury or illness case involving a loss of consciousness recordable?**
Yes, you must record a work-related injury or illness if the worker becomes unconscious, regardless of the length of time the employee remains unconscious.

31 **What is a "significant" diagnosed injury or illness that is recordable under the general criteria even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid, or loss of consciousness?**
Work-related cases involving cancer, chronic irreversible disease, a fractured or cracked bone, or a punctured eardrum must always be recorded under the general criteria at the time of diagnosis by a physician or other licensed health care professional.

* OSHA believes that most significant injuries and illnesses will result in one of the criteria listed in:

1. Death,
2. Days away from work,
3. Restricted work or job transfer,
4. Medical treatment beyond first aid, or
5. Loss of consciousness.

However, there are some significant injuries, such as a punctured eardrum or a fractured toe or rib, for which neither medical treatment nor work restrictions may be recommended. In addition, there are some significant progressive diseases, such as byssinosis, silicosis, and some types of cancer, for which medical treatment or work restrictions may not be recommended at the time of diagnosis but are likely to be recommended as the disease progresses. OSHA believes that cancer, chronic irreversible diseases, fractured or cracked bones, and punctured eardrums are generally considered significant injuries and illnesses, and must be recorded at the initial diagnosis even if medical treatment or work restrictions are not recommended, or are postponed, in a particular case.

Section 12
Personal Protective Equipment (PPE)

Criteria for the use of personal protective equipment (PPE) at Doster Construction Company defined:

1. The Safety of workers in the construction industry is primarily mandated by Federal, then State, and occasionally by local labor regulatory authority. At Doster Construction Company, our corporate policy is to provide our employees with the best personal protective equipment available, to meet, or exceed, all regulatory standards and practices, regardless of jurisdictional boundaries. All supervisory, management, and administrative personnel, should read and understand the full text of Subpart E as found in the Code of Federal Regulations under 29 CFR 1926.

2. Essential components of a well-protected construction worker, include, but are not limited to, protective equipment for eyes, face, head, and extremities. Appropriate protective clothing, respiratory devices, protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition whenever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact.

3. The most recognizable items of PPE in construction are usually the hardhat, known as a “protective helmet” to regulatory authorities, and eye protection. At Doster Construction Company our policy on wearing hard hats and eye protection is the 100% rule. All workers on all work sites shall wear an appropriate hard hat and safety glasses at any and all times that they are engaged in the process of construction. There are no exceptions during the structural construction process for either Doster Construction Company personnel or our subcontractors.

4. Once the structural construction process is complete, and there is no possibly of a head injury from a falling or flying object, or from electrical shock and burns, then, and only then, may the requirement for head protection within the structure be relaxed by a responsible Superintendent and Project Safety Manager. To clarify, the structural construction process is considered complete, only, when all overhead utilities, power services, and finish ceiling grid are completely installed on a given project. If interior workers are allowed to perform finish work such as painting, carpeting, communications, or other similar duties without hard hats, they must wear this PPE when entering or leaving the structure.

5. At no time is the requirement for eye protection to be relaxed.

When in Doubt, Wear your PPE!

There is no better way to display our professionalism, and identify us all as part of the Doster Construction Company Team.

Definitions and Information

PPE, Personal Protective Equipment, are the tools that ensure the basic health protection and safety of users. PPE is any device or appliance designed to be worn by an individual when exposed to one or more health and safety hazards. PPE includes all clothing and other work accessories designed to create a barrier against workplace hazards, and using PPE requires hazard awareness and training on the part of the user. Employees must be aware that the equipment does not eliminate the hazard; if the equipment fails, exposure will occur. To reduce the possibility of failure, equipment must be properly fitted and maintained in a clean and serviceable condition.

Employers are required to assess the workplace to determine if hazards that require the use of head, eye, face, hand, or foot protection are present or are likely to be present. If hazards or the likelihood of hazards are found, employers must select, and have affected employees use, properly fitted PPE suitable for protection from these hazards. Before doing work requiring the use of PPE, employees must be trained to know when PPE is necessary, what type is necessary, how it is to be worn, and what its limitations are, as well as its proper care, maintenance, useful life, and disposal.

Head Protection

Protective hats for head protection against impact blows must be able to withstand penetration and absorb the shock of a blow. In some cases, hats should also protect against electric shock. Recognized standards for hats have been established by the American National Standards Institute (ANSI).

Each type and class of head protector is intended to provide protection against specific hazardous conditions. An understanding of these conditions will help in selecting the right hat for the particular situation.
The wearer should be able to identify the type of helmet by looking inside the shell for the manufacturer, ANSI designation and class.

Protective hats are made in the following types and classes:

1. Type 1 - helmets with full brim, not less than 1 and 1/4 inches wide;
2. Type 2 - brimless helmets with a peak extending forward from the crown.

For industrial purposes, three classes are recognized:

1. Class A - general service, limited voltage protection
2. Class B - utility service, high-voltage protection
3. Class C - special service, no voltage protection.

Hats and caps under Class A are intended for protection against impact hazards. They are used in mining, construction, shipbuilding, tunneling, lumbering, and manufacturing.
Class B utility service hats and caps protect the wearer's head from impact and penetration by falling or flying objects and from high-voltage shock and burn. They are used extensively by electrical workers.

The safety hat or cap in Class C is designed specifically for lightweight comfort an impact protection. This class is usually manufactured from aluminum and offers no dielectric protection. Class C helmets are used in certain construction and manufacturing occupations, oil fields, refineries, and chemical plants where there is no danger from electrical hazards or corrosion. They also are used on occasions where there is a possibility of bumping the head against a fixed object.

Foot and Leg Protection

According to one survey, most of the workers in selected occupations who suffered foot injuries were not wearing protective footwear. Furthermore, most of their employers did not require them to wear safety shoes. The typical foot injury was caused by objects falling fewer than 4 feet and the median weight was about 65 pounds. Most workers were injured while performing their normal job activities at their worksites.

For protection of feet and legs from falling or rolling objects, sharp objects, molten metal, hot surfaces, and wet slippery surfaces, workers should use appropriate footguards, safety shoes, or boots and leggings. Leggings protect the lower leg and feet from molten metal or welding sparks. Safety snaps permit their rapid removal.

Aluminum alloy, fiberglass, or galvanized steel footguards can be worn over usual work shoes, although they may present the possibility of catching on something and causing workers to trip. Heat-resistant soled shoes protect against hot surfaces like those found in the roofing, paving, and hot metal industries.

Safety shoes should be sturdy and have an impact-resistant toe. In some shoes, metal insoles protect against puncture wounds. Additional protection, such as metatarsal guards, may be found in some types of footwear. Safety shoes come in a variety of styles and materials, such as leather and rubber boots, oxfords, and even tennis shoe models.

Safety footwear is classified according to its ability to meet minimum requirements for both compression and impact tests. These requirements and testing procedures may be found in American National Standards Institute standards. Protective footwear purchased prior to July 5, 1994, must comply with ANSI Z41.1-1967, USA Standard for Men's Safety-Toe Footwear. Protective footwear purchased after July 5, 1994, must comply with ANSI Z41-1991, American National Standard for Personal Protection-Protective Footwear.

Eye and Face Protection

Suitable eye protectors must be provided where there is a potential for injury to the eyes or face from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, potentially injurious light radiation, or a combination of these. Every protector shall be distinctly marked to facilitate identification of the manufacturer and must meet the following minimum requirements:

1. Provide adequate protection against the particular hazards for which they are designed
2. Be reasonably comfortable when worn under the designated conditions
3. Fit snugly without interfering with the movements or vision of the wearer
4. Be durable
5. Be capable of being disinfected
6. Be easily cleanable
7. Be kept clean and in good repair.

Ear Protection

Exposure to high noise levels can cause hearing loss or impairment. It can create physical and psychological stress. There is no cure for noise-induced hearing loss, so the prevention of excessive noise exposure is the only way to avoid hearing damage. Specifically designed protection is required, depending on the type of noise encountered and the auditory condition of employee.
Disposable earplugs should be used once and thrown away; non-disposable ones should be cleaned after each use for proper maintenance. Earmuffs need to make a perfect seal around the ear to be effective. Glasses, long sideburns, long hair, and facial movements, such as chewing, can reduce protection. Special equipment is available for use with glasses or beards.

Arms and Hand Protection

Burns, cuts, electrical shock, amputation and absorption of chemicals are examples of hazards associated with arm and hand injuries. A wide assortment of gloves, hand pads, sleeves, and wristlets for protection from these hazards is available.

The devices should be selected to fit the specific task. Rubber is considered one of the best materials for insulating gloves and sleeves and must conform to ANSI standards (copies available from ANSI, 1430 Broadway, New York, NY 10018). Other glove and clothing materials such as latex, nitrile, butyl rubber, neoprene, etc. are available. Each material is thoroughly tested and rated against specific chemical compounds. You need to know what hazard you are protecting against to choose the correct material.

Torso Protection

Many hazards can threaten the torso: heat, splashes from hot metals and liquids, impacts, cuts, acids, and radiation. A variety of protective clothing is available, including vests, jackets, aprons, coveralls, and full body suits. Fire retardant wool and specially treated cotton clothing items are comfortable, and they adapt well to a variety of workplace temperatures. Other types of protection include leather, rubberized fabrics, and disposable suits such as those made from tyvek.

Respiratory Protection

Information on the requirements for respirators to control the development of occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, and vapors is available in the **Section 18** of this safety program.

Section 13
Fall Protection

Objective

To establish minimum requirements for practices and procedures to protect employees from hazards of falls when working in elevated work areas such as rooftops, platforms or decks and aerial lifts or scissors lifts at a Doster Construction Company jobsite.

Company Policy Statement

We at Doster Construction Company believe that our employees are very important and our most valued asset. Fall Protection is an important aspect of our program. At Doster Construction Company, we practice a 100% tie-off policy once an employee is six feet above a lower level. This rule applies to all instances except where guardrail systems or other fall protection systems are provided. (See Articulating Booms and Scissors Lifts, Section 27, for additional requirements). In some cases we will also implement fall protection at a lesser height if there is a danger or hazard in the area below.

Responsibilities

1. Employer Responsibilities

1.1. Ensure a written worksite specific fall protection plan is in place.
1.2. Ensure that a Fall Protection System is being used.
1.3. Ensure that guardrails are used when practicable.
1.4. Ensure a Fall Restraint system is in place when applicable.
1.5. If a Fall Restraint cannot be used, ensure a Fall Arrest system is in place.
1.6. Provide appropriate Control Zone procedures if the above are not appropriate.
1.7. Ensure supervisors and workers are trained.
1.8. Ensure all fall equipment is safe, maintained, inspected and used correctly.
1.9. Investigate any anomalies in the system to make recommendations so that such anomalies will not happen again.
1.10. Update the program as needed.
1.11. Follow up on our program.

2. Supervisor Responsibilities

2.1. Ensure the program is prepared for each site.
2.2. Ensure the program is being implemented.
2.3. Inspect the program as it is used.

2.4. Review the program
2.5. Investigate any anomalies and make recommendations to prevent reoccurrence.
2.6. Investigate all workers reports of anomalies to the system.
2.7. Keep a log of all workers trained for the fall protection program and topics that were covered before they work in the fall protected area.
2.8. Ensure all workers have a copy of the fall protection program.
2.9. Inspect, maintain, and use the equipment in the recommended methods.
2.10. Ensure that all workers are provided with the appropriate equipment.
2.11. Observe workers, work practices and site operations and correct when necessary.

3. Worker Responsibilities

3.1. Know the Fall Protection Plan that has been established.
3.2. Follow the procedures, as trained. If uncertain please ask you supervisor for further training.
3.3. Inspect equipment (daily before use).
3.4. Maintain equipment.
3.5. Ensure the equipment is used as the manufacturer recommends.
3.6. Report any anomalies to the supervisor.
3.7. It is a condition of employment that all managers, supervisors, and workers comply with the company safety policy and safety programs.

Training Requirements

Each Employee who may be exposed to fall hazards will be trained to recognize the hazards and the procedures to follow, this in an effort to minimize the hazards. A competent person will provide the training.

The competent person must train employees in the following areas:

- Fall hazards in the work area
- Use and operation of the fall protection systems used
- Role of employees in fall protection plans
- What rescue procedures to follow in case of a fall
- Overview of the OSHA fall protection standards.

A training record will be maintained for each employee. Retraining should be done if there is a change in the fall protection system being used or if an employee's actions demonstrate that the employee has not retained the understanding or skills important to fall protection.

Fall Protection Plan

A written fall protection plan will be developed and implemented when a fall hazard of 25 feet or more exists or when a control zone is required. Several work trades will require a written fall protection plan specific to the task, regardless of the height exposure.

The intent of the plan is to:

1. Help prevent falls
2. Assist workers and supervisors in the identification of the fall hazards within the site before work begins at heights.
3. Assist in the selection of an appropriate fall protection system(s), determine any alternatives (if applicable).
4. Assist in rescue procedures for someone if a fall should occur.

It is our company policy that all managers, supervisors and workers comply with the fall protection guidelines we have established. We have several checklists to help our supervisors and workers in identifying problem areas on the site. These checklists will be of much help when our supervisors are developing the site-specific program.

We have outlined some specific responsibilities for ourselves (the employer), our supervisors and our workers as follows:

Doster Construction Company

Safety Manual
Revised 2005
Updated 4/1/08

Signature of Management and Date _____

Site specific Fall Protection Work Program

Company: _____
Address: _____
Phone: _____
Date: _____
Project: _____
Location: _____
Phone: _____
Date: _____
Supervisor: _____
Site Safety Representative: _____

Job Description and Type of Work

New ☐ Alterations ☐ Demolition ☐ Maintenance ☐ Repair ☐

Specific Work Area: _____

A brief description of the type of work being done:

_____
_____
_____
_____
_____

Is a control zone used: Yes ☐ No ☐
If Yes where: _____

Is the control zone marked: Yes ☐ No ☐
How: _____

What is the set-back distance of the control zone area:

Feet: _____

List the Fall Hazards:

_____

_____

_____

_____

_____

Draw a diagram of the control zone:

Describe the type of Fall Protection System to be used (Fall Protection Equipment):

_____
_____
_____
_____

Other considerations:

_____
_____
_____
_____

Describe the type of work being done in other Fall Hazard areas (if applicable):

_____
_____
_____
_____

List the Fall Hazards

_____
_____
_____
_____

Rescue Procedures
Describe in detail the procedure for rescue after a fall occurs:

_____
_____
_____
_____
_____

Other concerns or considerations:

Hazard Identification	Yes	No	Fall Prevention System / Related Hazard
Fall Protection			
Guardrails			
Toe Boards			
Horizontal Lifelines			
Vertical Lifelines			
Harness and Lanyard			
Warning Lines			
Wire Rope Lifeline			
Fiber Rope Lifeline			
Rope Grab			
Fall Arrest Block			
Tie Backs			
Safety Nets			
Wall Openings (Windows/Doors)			
Floor Openings/Open Holes			
Leading Edge (Roof/Deck/Slab)			
Tripping Hazards			
Other Trades In Work Area			
Manholes			
Shafts			
Drop Off Points			
Fly Forms			
Swing Stages			
Excavations			
Crane Operations			
Work Access/Egress			
Elevated Walkways			
Electrical Hazards			
Scaffold Work			
Canopies			

***** Complete form and add to Site Specific Fall Protection Plan***

Fall Protection Equipment Log:

Ensure all required equipment is provided, identified, inspected, and put in a log book before use.

Equipment Log (Jobsite ID): _____

Equipment Type*:	Equipment #:	Date Inspected	Date Removed	Reason for Removal

**** Equipment Type:***
(H) Full Body Harness
(L) Lanyard
(G) Guardrails
(HLL) Horizontal Life Line
(VLL) Vertical Life Line
(SN) Safety Nets
(RC) Rebar Caps / Rebar Guards

All workers who will be exposed to fall hazards are informed of those hazards, and are instructed in the fall protection system to be used and the procedures to be followed. All contents of this program have been conveyed to the workers. All necessary equipment has been provided.

Site Superintendent: _____
Signature: _____
Print Name: _____
Date: _____
Site Safety Representative: _____
Signature: _____
Print Name: _____
Date: _____

Employee Name	Signature

Fall Protection Systems

One of the following systems should be in place whenever an employee is exposed to a fall of greater than six feet.

Guardrail Systems

Guardrails are needed at the edge of work areas 6 feet or more in height to protect employees from falling. Guardrail systems need to meet the following criteria:

- Toprail is 42 inches, +/- 3 inches above the walking / working level
- Midrail is located midway between the top rail and the walking / working level

Personal Fall Arrest Systems

There are three main components to the personal fall arrest system. This includes the personal protective equipment the employee wears, the connecting devices and the anchorage point.

Personal Protective Equipment

- Full body harnesses are required. The use of body belts is prohibited.
- The attachment point of the body harness is the center D-ring on the back.
- Harnesses or lanyards that have been subjected to an impact load shall be destroyed.
- Load testing shall not be performed on fall protection equipment.

Connecting Devices

This device can be a rope or web lanyard, rope grab or retractable lifeline.

- Only locking snaphooks may be used.
- Lanyards and vertical lifelines need a minimum breaking strength of 5,000 pounds.
- Lanyards may not be clipped back to itself (e.g. around an anchor point) unless specifically designed to do so.
- If vertical lifelines are used, each employee will be attached to a separate lifeline.
- Lifelines need to be protected against being cut or abraded.

Anchorage

Secure anchor points are the most critical component when employees must use fall arrest equipment. As a minimum, the following criteria must be considered for each type of anchor point:

- Structure must be sound and capable of withstanding a 5,000 pound static load / person attached.
- Structure / anchor must be easily accessible to avoid fall hazards during hook up.
- As much as possible, structures used as anchor points must be at the worker's shoulder level or higher to limit free fall to 6 feet or less and prevent contact with any lower level.
- Choose structures for anchor points that will prevent swing fall hazards. Potentially dangerous "pendulum" like swing falls can result when a worker moves horizontally away from a fixed anchor point and falls. The arc of the swing produces as much energy as a vertical free fall and the hazard of the swinging into an obstruction becomes a major factor. Raising the height of the anchor point can reduce the angle of the arc and the force of the swing.
- Horizontal lifelines can help maintain the attachment point overhead and limit the fall vertically. A qualified person must design a horizontal lifeline.

Complete system

- If a fall occurs, the employee should not be able to free fall more than 6 feet nor contact a lower level.
- A personal fall arrest system that was subjected to an impact needs to be removed from service immediately.
- Personal fall arrest systems need to be inspected prior to each use and damaged or deteriorated components removed from service.
- Personal fall arrest systems should not be attached to guardrails nor hoists.

**Reference: Environmental Health and Safety, University of Florida, 2002.

Fall Protection Equipment Inspection Report

Project No.:_____Project Name:_____

Inspected By:_____ Date:_____

Category Checklist:

1. Webbing
2. Stitching
3. Eyelets
4. D- Ring(s) / Bucke(s)
5. Body Pad(s) (if applicable)
6. Safety Latches
7. Data Tag(s) / Certification
8. Personally Owned

Employee Name:	Equipment Manufacturer ID:	Type	Category (Y) for OK (N) for Replace							
			1	2	3	4	5	6	7	8

Fall Protection Plan

Doster Construction Company, Inc. is committed to providing, not only to our employees but those of our subcontractors, with a safe work site in which to work. We firmly believe that the personnel that are involved in the construction of our projects are our most important resource. Therefore, we have established this Fall Protection Plan for our Multifamily Division to assist our project management teams in their effort to meet our goal of an accident free site for all our projects.

Doster has been a leader in the construction industry in many different areas for many years. With the use of the following program, Doster's jobsites will not only be safer, more productive, and more profitable, but Doster will also continue to be on the leading edge in the area of safety management.

This program will address the use of conventional and unconventional methods of fall protection during several tasks or operations on projects that fall under our Multifamily Division. The tasks or operations included in the program are:

1. Installation of Floor Joists
2. Installing Floor Sheathing
3. Building and Standing Up Walls on Elevated Floors
4. Erecting and Installing Roof Trusses
5. Roof Sheathing
6. Building Roofing
7. Exterior Sheathing

It is the responsibility of Doster Construction Company and its subcontractors to implement this program and train its employees on the requirements of this program. Additionally, provide continual observational safety surveys of these tasks or operations and to enforce the program, correcting any unsafe practices and conditions immediately.

Safety Training and Documentation

All employees involved in any of the tasks or operations described on this program shall be trained in the requirements of the program and to recognize any existing hazards that present an exposure and correct these hazards immediately. All training documentation copies will be kept at the jobsite trailer for project archives.

Task and Operations

1. *Installation of Floor Joists*

   To minimize the exposure to fall hazards while installing floor joists employees will be trained in this task. While installing the floor joists, the first floor joist will be rolled into position and secured by workers standing on interior ladders, rolling scaffolds or a job built platform or walk board (2 by 12). Successive joists will be set on top of the wall, rolled into position (if necessary) and secured using the same methodology stated above. At several times during the installation process of floor joist an employee will have to position himself on the interior top plate of the wall for the purpose of adjusting, straightening and securing the joist in its final position. **This employee will have no other duties than the ones stated above.**

Sample Walk Board for Floor Joist Installation

If a walk board is to be used, this shall be set so that the top plate of the exterior wall is at 39", the top plate becomes a guardrail. At locations where window openings are present place a guardrail (2 by 4) across the mid level height (if applicable).

Guardrails Protect Employees from Falling Through a Window

2. *Floor Sheathing*

Floor sheathing operations require trained personnel performing the task. Before starting to sheath the floor employees need to be aware of the hazards present and identify those hazards so the degree of awareness is such that it helps minimize a fall.

The first row of floor sheathing must be installed by workers on the ground, ladders, or sawhorse scaffolds. The employees performing floor sheathing operations need to establish a deck to work from. While performing floor sheathing operations only employees that have been trained will work on the leading edge of the established deck. Employees performing other duties and /or tasks associated with the floor sheathing operation will be restricted to areas away from the leading edge and protected on the perimeter of the building by pre-installed guardrail systems.

- Guardrails

  Guardrail systems consist of stanchions not more than ten feet apart with a mid and top rail at approximately 21 and 42 inches in height. These guardrails systems will consist of manufactured stanchions or posts inserted

in a pre-installed gusset on the exterior top plate of walls with horizontal 2 by 4s as rails. Employees performing the installation of the guardrails systems will have limited or no exposure to fall hazards due to the installation process of the perimeter guardrail system (from the inside of the building and from ladders, walk boards or platforms).

Guardrail systems will be installed at all areas where an exterior fall hazard exists and before floor joist installation begins. The guardrail system will only be removed when the exterior walls of the floor above have been installed and secured, all opening (windows or doors) have been addressed with protection and when exterior wall stud spacing is not more that 16" O.C..

Installation Option # 1

From the inside employee will install gusset, stanchion and horizontal rails.

Gusset and stanchion.

All splicing shall be done at stanchions.

Installation Option # 2

While walls are laying down gusset plates are nailed in place and stanchions are installed at intervals not top exceed 8'.

After gusset plates and stanchions are secured, 2 by 4 railing is installed at toe board, mid rail and top rail locations.

The crew then stands up the wall in place and secures it to the floor.

After the walls are stood up, rails are already in place for employees to be protected from falls.

Alternative Means for Fall Protection (Option # 1 – Non Mandatory):

- Personal Fall Protection Equipment

  The use of personal fall protection equipment while performing floor sheathing operations will include a full body harness, retractable lanyard and a reusable anchorage point.

  As soon as a suitable, workable deck is established the anchorage will be installed where the employee can tie off to. At least two anchorages will be required per employee as they move down the building layout sheathing the floor; installing one where his working towards and removing the anchorage behind him.

Sample of Reusable Anchor
(Guardian Fall Protection)

Saf-T-Strap

There are several different types of anchor points currently available that can be used during this phase in the construction process

3. Building and Standing Up Exterior Walls at Elevated Floors

Only trained and qualified employees will be allowed on the deck while performing erection of exterior wall at elevated levels of the building. The area shall be clearly identified as a CAZ (Controlled Access Zone) with signs and danger tape. This shall be done to prevent any falling material to strike other employees unaware of the ongoing operation.

Entire walls or sections of wall shall be built on the deck; employees working on the building deck will be protected at all times by pre-installed guardrails systems as described in Section 2 - Floor Sheathing. Built walls will then be presented to the exterior edge by employees behind the wall and stood up and secured in place.

Once the walls have been stood up, guardrails will be installed on any wall openings such as windows and/or doors before the exterior guardrails can be removed.

If wall studs are 16" O.C. or less personal fall protection equipment will not be deemed necessary.

Alternative Method for Erecting Exterior Walls (Option # 1 – Non Mandatory)

Sections of wall shall be built as much as feasibly possible on the ground. Partially built walls will then be presented from the ground to the employees above. Employees on the working level (elevated) shall only approach the edge of the building and remove guardrails when the wall has reached the working level and it is safe to do so. **At not time will an employee be allowed on the leading edge unless some means for fall protection is it place.**

Erection of a partially built wall on to an elevated level

4. *Erection and Installation of Roof Trusses*

All employees performing roof truss erection and installation shall be trained to do so. Truss erection and installation will require that only trained employees are in the area and perform the work, thus a CAZ (Controlled Access Zone) shall be clearly identified with signs and danger tape to warn other employees of the hazardous conditions.

Before the truss erection occurs, employees will determine which trusses will require the installation of fall protection anchors for future roof operations. This shall be determined in coordination with the project Superintendent and based on the truss layout for the project. **Truss fall protection anchors shall not be spaced more than 15' apart from each other.** The installation of the fall protection anchors shall be done while the truss is on the ground and before it is erected to the elevated level.

Sample Permanent Truss Anchor
(Truss Boss – Guardian Fall Protection)

While installing the truss at the elevated work level employees shall work from the inside of the building, a walk platform consisting of 2 by 12 wood shall be installed so that the top plate of the exterior wall is at 39", thus becoming a guardrail. If any window openings are encountered and present a fall hazard an additional guardrail shall be installed to be a mid rail. During the truss installation process one employee shall be responsible for bracing and securing the trusses together, this will be his only responsibility. This employee will not use conventional means for fall protection due to the unstable nature of the trusses at this point, his work will involve a great

Employee installing truss from inside of building

deal of concentration and awareness to minimize the likelihood of a fall. After bracing and securing two trusses a walk platform (2 by 12) shall be in place for this employee to walk on.

Spreading trusses on the elevated level and using them as a platform while the truss installation is not permitted.

The practice of “spreading” trusses for installation is not permitted

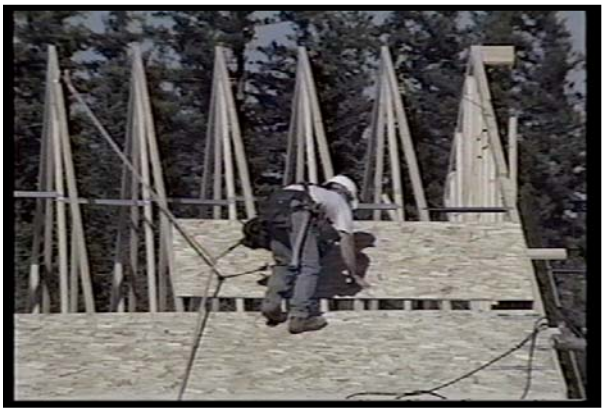
5. *Roof Sheathing*

All employees involved in roof sheathing operation shall be trained and qualified in this type of work.

First row of sheathing installed from the inside of the building with the use of walk platforms.

Since roof structures are unstable until some sheathing has been put in place, the initial or bottom row of sheathing shall be installed from the inside of the building to minimize the exposure of the employee to a fall.

All employees performing roof sheathing operation shall be protected from fall with personal fall protection equipment as anchorage points have been provided during the truss erection and installation.



Roof sheathing operations with complete personal fall protection in place

6. *Building Roofing Operations*

All employees involved in the roofing operations of the building shall be trained and qualified in this type of work.

All employees performing roofing operations shall be protected from fall with personal fall protection equipment as anchorage points have been provided during the truss erection and installation.

Employees shall determine access points (via ladders) to the roof considering 100% tie off requirements apply.

Rope grab in place for employee as he steps of the ladder and on to the roof

7. *Exterior Sheathing*

All employees performing exterior sheathing shall be trained in their work, the training shall include identification of potential hazards and a measure to control them.

Exterior sheathing operations shall be done with means that keep employees safe and away from hazards. The use of ladders, ladder jacks, scaffolds, aerial lifts, etc. are all feasible safe means of performing this type of work. Under no circumstances an employee shall perform exterior sheathing from the inside of the building unless that employee is protected from a potential fall with personal equipment or guardrails.

This operation is not permitted under this program

Balcony Fall Protection Means

There may be other areas not covered by this program which may present fall hazards to employees working at our jobsite. These hazards can be eliminated with the proper preplanning and surveying of the job.

1. *Balconies*

All balconies on the project shall be protected with adequate guardrails during the framing phase and thereafter until exterior sheathing operations commence. Where guardrails have been removed for the installation of siding, windows or other component of the building employees will be protected with personal fall protection equipment in the

form of full body harness and a fixed lanyard, retractable lanyard or a properly used rope grab system.

Alternative means for fall protection shall be in place before employees continue to work on an unprotected balcony. Two anchorage points in the form of safety straps for wood frame construction shall be installed at door header locations at the entrance way to every balcony found in the building.

Fall protection strap installed at balcony entrance.
(www.safetystrap.com)

All employees using this system shall be oriented in the specific requirement of this program and in the use, maintenance and storage of the personal fall protective equipment used.

The two fall protection straps installed on the header shall **only** be removed under the coordination of the Doster Construction Company superintendent and after the installation of the permanent railing at the balcony location.

Our Web site

www.dosterconstruction.com

References

- Guardian Fall Protection Equipment.
  - Truss Boss.
  - Global Reusable Anchor.
  - Perimeter Guardrail Systems
- Fall Hazards During Residential Construction Work (University of West Virginia) **OSHA Grant# 46C3-HT19.**
- Oregon Occupational Safety and Health Administration (OR-OSHA) – Fall Protection – Safe Practices for setting and bracing wood trusses and rafters.
- Montana Department of Labor & Industry – Fall Protection Plan for Residential Construction – Occupational Safety and Health Bureau
- Fall Protection for Residential Construction – Georgia Safety, Health & Environmental Conference 2004 – Pro-Safe Solutions

Doster Construction Company

Multifamily Division
Revision 4
12/01/08

Training Records	**Current Date:**	
Job Name / Code:		
Framing Company:		

Operation:

1. Floor Joist Installation:

Employee Name	Signature
Employee(s) Designated on Interior Top Plate	Signature

This page must be signed and stored by framing contractor in files prior to start of work. This form is auditable by Doster Construction Company Safety Dept.

DOSTER CONSTRUCTION COMPANY

2. Floor Sheathing Installation:

Employee Name	Signature

3. Building and Standing Exterior Walls:

Employee Name	Signature

This page must be signed and stored by framing contractor in files prior to start of work. This form is auditable by Doster Construction Company Safety Dept.

4. Erection And Installation of Roof Trusses:

Employee Name	Signature
Employee(s) Designated for Truss Bracing and Securing	Signature

4. Roof Sheathing:

Employee Name	Signature

This page must be signed and stored by framing contractor in files prior to start of work. This form is auditable by Doster Construction Company Safety Dept

5. Roofing Operations:

Employee Name	Signature

6. Exterior Sheathing:

Employee Name	Signature

This page must be signed and stored by framing contractor in files prior to start of work. This form is auditable by Doster Construction Company Safety Dept

Doster Construction Company

Multifamily Division
Revision 4
12/01/08

Training Records		**Current Date:**	
Job Name / Code:			
Framing Company:			

Company Representatives

Framing Co. Job Supervisor Name	**Signature**
Foreman(s)	**Signature**
Framing Safety Officer	**Signature**
Doster Construction Job Superintendent	**Signature**
Doster Construction Safety Director	**Signature**

This page must be signed and in files prior to start of work.

DOSTER CONSTRUCTION COMPANY

Section 14
Electrical Safety

Purpose

Approximately 150 workers are killed in the construction industry due to contact with live electrical parts. The purpose of this section is to establish a program where the exposure to live electrical parts is minimized or null and to bring awareness to all employees of the electrical issues found at construction sites that are potential causes for death. The three main causes of electrical fatalities in construction sites are:

- Contact with overhead power lines.
- Contact with live circuits such as panels, panel boxes, receptacles, exposed wiring.
- Poorly maintained cords and tools.

Overhead Power Lines

Working near overhead power and distribution lines can be fatal. Over 90% of contacts occured on power distribution lines that thought were de-energized. Employees have to go through basic steps before working near overhead power lines.

1. Contact local power company to de-energize the overhead power line in question.
2. After de-energizing has taken place request documentation from the power company on completed work requested by the construction.
3. Before starting to work near de-energized overhead power line perform a task meeting to bring awareness to all employees on electrical hazards still potentially present.
4. After completing the task contact power company for re-energizing the lines. Communicate to all employees lines have been re-energized.

In some instances power companies will or cannot de-energize overhead power lines and several precautions have to be put in place to keep employees safe while working near these lines.

1. All employees working near power lines will remain at least ten (10) feet away from lines.
2. Warning signs will be posted around area to bring awareness to employees performing task near lines as well as other employees in the vicinity. At the ground level, identify and barricade the area where work will take place to prevent other employees from entering.

3. Before starting to work near overhead power lines a task meeting will take place to bring awareness to all employees performing the work. **All conductive equipment and tools used by the employees will be prohibited (i.e. metal ladders, hand tools, etc.).**
4. Ground person will at all times be present to supervise the works' proximity to power lines is not jeopardized. **Assure at all times that ten (10) feet clearance is maintained.**

Electrical Closets and Panels

Working on electrical panels is an electrician job, and only electricians will be allowed to perform any work on panels. Any panels installed for construction operations will be locked to prevent unauthorized use by any other construction personnel. **At all times working on de-energized panels and electrical equipment shall be priority and shall be exercised.**

Temporary panel box locked to prevent unauthorized usage.

Cardboard is not an appropriate cover and is not permitted under this program.

Working on or near energized panels with more than 50 volts to ground is strictly prohibited unless proper personal protective equipment is in place as established in the NFPA 70E "Standard for Electrical Safety in the Workplace", reference article 130 "Working On or Near Live Parts". **At no time energized panels shall be left unattended.**

Receptacle Outlets

This receptacle should be de-energized.

During construction operations (including when permanent building power is available), if a receptacle is energized and being used a receptacle cover will be required at all times.

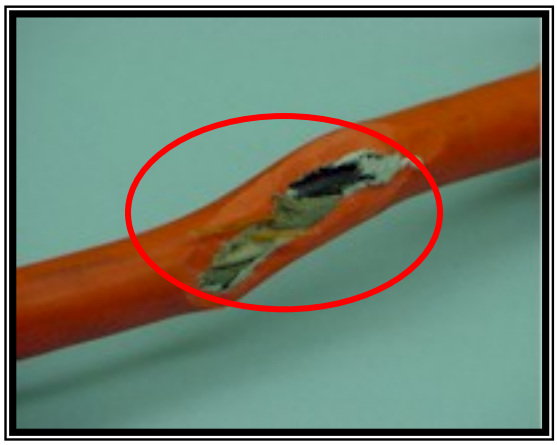
Electrical Cords and Tools

Electrical cords and portable electric tools shall be of three-wire type and marked for hard or extra hard usage. **The minimum gauge extension cord allowed on a Doster Construction Company jobsite is 14.** All electrical cords and tools shall be maintained in good condition free of cuts, frays and with a strain relief. Some of the most frequently cited OSHA violations in regards to electrical cords and tools are due to broken wires or ground prongs and plastic or rubber coating missing.

All 120-volt cord sets (extension cords) must have an equipment-grounding conductor that must be connected to the grounding contacts of the connector(s) on each end of the cord. **Every electrical cord or tool when connected to a power source shall be protected from any deviation in current, i.e. Ground Fault Circuit Interrupter (GFCI).**

- *Repairing Cords:*
  Only electrical cords of 14 gauge or larger can be repaired*. Splices are not allowed under this program; only repairs to ends of electrical cords are allowed when performed by a qualified person.*

Repairable cord.



Not repairable under this program.

Multiple outlet "power strips' are not suitable for use at construction sites and it is not allowed under this program.

Good control practices will help protect employees and tools:

- Inspect all tools and electrical cords before each use.
- Use only cords that are three-wire type.
- Use cords marked for hard or extra hard use.
- Assure that cords and tools are equipped with a strain relief.
- Always plug cords or tools with a GFCI.
- Remove cords from service that present damage such as frays or cuts to the outer sheathing.

Additional Tool Safety Tips:

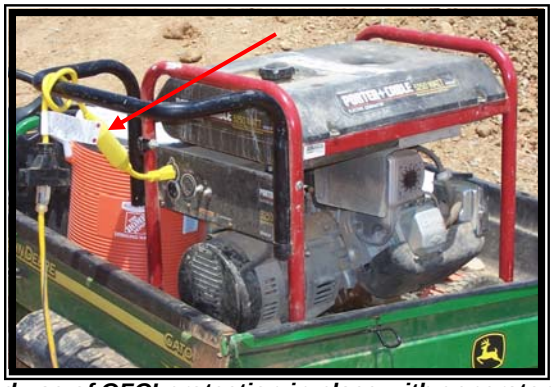
- Never carry a tool by the cord.
- Never yank the cord to disconnect it from the receptacle.

- Keep cords away from heat and sharp edges.
- Disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits, etc.
- Avoid accidental starting. Do not hold fingers on the switch button while carrying a plugged-in tool.
- Use gloves and appropriate safety footwear when using electric tools.
- Store electric tools in a dry place when not in use.
- Do not use electric tools in damp or wet locations unless they are approved for that purpose.
- Remove all damaged portable electric tools from use and tag them: "Do Not Use."
- Use Double-Insulated Tools.

Temporary Wiring and Lighting

Temporary Wiring

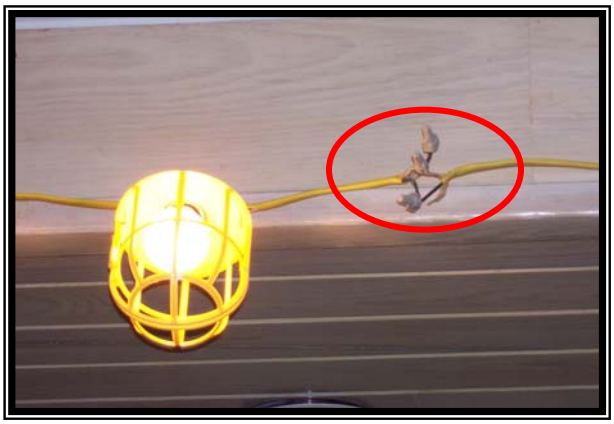
- All temporary wiring shall be effectively grounded.
- Temporary distribution boxes used on the project will have ground fault circuit interrupters (GFCI) in place at all times.
- Temporary wiring cords shall be used only in continuous lengths without splice except with the use of junction boxes to protect from accidental shock.
- Sharp corners and projections shall be avoided.
- All portable electric generator sets used on a Doster Construction Company jobsite shall be equipped with GFCI receptacles or be used with GFCI adapters.



Good use of GFCI protection in place with generator set.

Temporary Lighting

- Temporary lights shall be equipped with guards to prevent accidental contact with the bulb.
- Temporary lights shall be equipped with heavy-duty electric cords with connection and insulation maintained in safe condition.
- Electric cords shall not suspend temporary lights unless cords and lights are designed for this means of suspension.
- **Splices shall be allowed only when a junction box is used.**



This practice is not allowed under this program.

Optional - Assured Equipment Grounding Conductor Program

This program consists of establishing and maintaining an assured equipment grounding conductor system on construction sites covering all cord sets, receptacles of and equipment connected by cord and plug which are available for use or used by employees. All cord sets, receptacles, and cord-and-plugs connected to 15-20 amp, 120 volt, single-phase circuits that are not part of the permanent wiring of the existing structure or building shall be tested and coded. You should assign or arrange for a qualified electrician to administer the program.

1. Test Records – Test verification must be by means of color-coded marking tape on the receptacle, cord set, or equipment to identify that it has passed the test and to indicate the date (month or quarter) in accordance with the appropriate coding scheme.

2. Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools are positively and distinctly marked with the approval of the Underwriter's Laboratories, Inc. or Factory Mutual Laboratories. Testing and coding of these tools will follow the same inspection program as 3-wire type tools.

3. All tests performed as required should be recorded. This test record will identify each receptacle, cord set, and cord and plug connected equipment that passed the test, and will indicate the last date it was tested. All records are to be kept on file.

Program Requirements and Tests

Equipment grounding conductors are to be installed and maintained in accordance with this procedure:

1. Installation – Equipment grounding conductors should be installed as follows:

    1.1. All 120 -volt, single-phase, 15 or 20-ampere receptacles must be grounding type and their contacts grounded by connection to the equipment-grounding conductor of the circuits supplying the receptacles in accordance with the applicable requirements of the National Electrical Code.

    1.2. Extension cords used with portable electric tools and appliances shall be of three-wire type and be hard service cord or junior hard service cord usage and shall be maintained in good condition. Examples of these types of flexible cords include hard service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).All 120-volt cord sets (extension cords) must have an equipment-grounding conductor that must be connected to the grounding contacts of the connector(s) on each end of the cord.

    1.3. The exposed non-current-carrying metal parts of 120-volt cord-and-plug connected tools and equipment that are likely to become energized must be grounded in accordance with the applicable requirements of the National Electrical Code. Portable tools and appliances protected by an approved system of double insulation or equivalent need not be grounded. Where such an approved system is employed, the equipment shall be distinctively marked.

2. Visual Inspection – Employees are to visually inspect flexible cord sets and equipment connected by cord and plug before each day's use for external defects (deformed of missing pins, insulation damage and indication of possible internal damage). Where there is evidence of damage, the damaged item must be taken out of service, by the employee, taken to his foreman who will tag the item unsafe, remove it from service until it is tested and any necessary repairs have been made.

3. All 120 volt, single-phase, 15 and 20-ampere receptacles and 120-volt cord-and-plug connected equipment that is required to be grounded must be tested as follows:

3.1 All equipment grounding conductors tested for continuity and is electrically continuous.

3.2 Each receptacle and attachment cap or plug tested for correct attachment of the equipment-grounding conductor. The equipment-grounding conductor must be connected to its proper terminal.

4. Testing Schedule – All required tests are to be performed by a qualified electrician, and in accordance with the following requirements:

4.1 Before first use

4.2 Before equipment is returned to service following any repairs

4.3 Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example when a cord set has been run over)

4.4 At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage may be tested at intervals not exceeding 6 months

5. Temporary Wiring - All temporary wiring shall be effectively grounded in accordance with applicable OSHA.

5.1 Receptacles for attachment plugs shall be of approved, concealed contact type with a contact for extending ground continuity and shall be so designed and constructed that the plug may be pulled out without leaving any live parts exposed to accidental contact. Duplex and 4-plex outlet boxes used on extension cords will be weatherproof and of the approved sealed type.

5.2 Where different voltages, frequencies or types of current (AC or DC) are to be supplied by portable cords, receptacles shall be of such design that attachment plugs used on such circuits are not interchangeable.

5.3 Attachment plugs or other connectors supplying equipment at more than 300 volts shall be of the skirted type or otherwise so designed that arcs will be confined.

5.4 Attachments plugs for use in work areas shall be so constructed that they will endure rough use and be equipped with a suitable cord grip to prevent strain on the terminal screws.

5.5 Flexible cord shall be used only in continuous lengths without splice except suitable molded or vulcanized splices may be used where properly made and the insulation shall be equal to the cable being spliced and wire connections soldered.

5.6 All extension cords and temporary distribution boxes used on the project will have ground fault circuit interrupters (GFCI) in place at all times. Power tools, not of the double insulated type, which are connected directly to permanent power sources, will be protected by GFCIs.

5.7 Cable passing through work areas shall be covered or elevated to protect it from damage that would create a hazard to employees.

5.8 Portable hand lamps shall be of molded composition or other type approved for the purpose. Brass-shell or paper-lined holder shall not be used. Hand lamps shall be equipped with a handle and a substantial guard over the bulb and attached to the lamp holder or the handle.

5.9 Worn or frayed electric cables shall not be used.

5.10 Extension cords shall be protected from accidental damage caused by traffic, sharp corners or projections and from pinching in doors or elsewhere.

5.11 Extension cords shall not be fastened with staples, hung from nails, or suspended by wire or any other conductive material.

5.12 Cables passing through or into junction boxes, switch gear, etc., shall be protected against physical damage by grommets, box connectors, etc.

6 Temporary Lighting

6.1 Temporary lights shall be equipped with guards to prevent accidental contact with the bulb.

6.2 Temporary lights shall be equipped with heavy-duty electric cords with connection and insulation maintained in safe condition. Electric cords shall not suspend temporary lights unless cords and lights are designed for this means of suspension. Splices shall have insulation equal to that of the cable.

6.3 Cords shall not be placed in working spaces and walkways or other locations exposed to damage unless protected.

6.4 Portable electric lighting used in moist and/or hazardous locations, i.e., drums, tanks, and vessels, shall be operated at a maximum of 12 volts.

Lockout and Tagging of Circuits

No employee or subcontractor is to work in such proximity to any part of an electric circuit where the worker could contact the electric power circuit in the course of work. The worker is to be protected against electric shock by deenergizing the circuit and grounding it effectively by insulation or other means.

1. Controls
   Controls that are to be deactivated during the course of work on energized or deenergized equipment or circuits shall be tagged.

2. Equipment and circuits
   Equipment or circuits that are deenergized shall be rendered inoperative and shall have tags attached at all points where such equipment or circuits can be energized.

3. Tags
   Tags shall be placed to identify plainly the equipment or circuits being worked on.

Assured Equipment Grounding Checklist

Jobsite: _____

Job No.: _____

1. Equipment Tested _____
2. Qty. Tested _____
3. Date _____
4. Inspector's Initials _____
5. Double Insulated Test (y/n)
6. Ground Continuity Test (y/n)
7. Monthly (y/n)
8. Quarterly (y/n)
9. V-AC System 120/240 _____
10. Hammer Drill _____
11. Worm Drive Saw _____
12. 1/2" Drill Motor _____
13. 3/8” Drill Motor _____
14. Sawzall _____
15. 4 1/2" Grinder _____
16. 7"/9" Grinder _____
17. Die Grinder _____
18. Portaband _____
19. Screw Gun _____
20. Chop Saw _____
21. Bench Grinder _____
22. Heat Shrink Gun _____
23. Spider Box _____
24. Drill Press _____
25. Extension Cord _____
26. 3-Way Splinter _____

Testing equipment

1. Voltmeter - use on power tools - set on OHM scale

2. E-Z check receptacle circuit tester - use to check extension cords (test or open ground, reverse polarity, open, hot and neutral, reverse ground and hot)

* For further information on how to perform an assured grounding test, contact your Project Safety Manager.

The following are the monthly color codes:

January	**Orange**
February	**Blue**
March	**White**
April	**Green**
May	**Orange**
June	**Blue**
July	**Yellow**
August	**Purple**
September	**Red**
October	**Brown**
November	**White**
December	**Green**

The following are the quarterly color codes:

1st Quarter	
January, February, March	**White**
2nd Quarter	
April, May, June	**Blue**
3rd Quarter	
July, August, September	**Red**
4th Quarter	
October, November, December	**Green**

Tests will be completed by the fifth day of each month for monthly test or by the fifth day of the first month in the quarter for quarterly tests.

NOTE: Implementation of an Assured Grounding Program for a specific jobsite will require the written approval of the Corporate Safety Director and Site Superintendent.

Section 14.1
Control of Harzardous Energy

Many serious accidents have happened when someone thought a machine or the power to it was safely off. "Lock-out tag-out" is a way to protect yourself and others by ensuring that machines remain completely, temporarily off. Without a lock-out tag-out system there is the possibility that a machine will unexpectedly start up, either because of stored energy which was not correctly released or through the actions of someone starting the process without realizing that it isn't safe to do so.

The lock-out tag-out standard requires that hazardous energy sources be "isolated and rendered inoperative" before maintenance or servicing work can begin. These energy sources include electrical (either active current or stored as in a capacitor), pneumatic, hydraulic, mechanical, thermal, chemical, and the force of gravity. **It is important to remember all of the energy sources must be isolated and rendered inoperative.** Overlooking an energy source has proved fatal on several occasions.

OSHA requires three basic elements in a lock-out tag-out program. These are training, written procedures, and inspections. Training is required for two types of people; "**authorized employees**" and "**affected employees**." Authorized employees are people who do the maintenance or servicing work. They are the people who actually perform the lock-out tag-out. Affected employees are people who may be affected by or work near equipment which is locked or tagged out. **Affected employees are not permitted to perform servicing or maintenance work which requires a lock-out or tag-out.**

Written procedures detailing the lock-out tag-out procedure are required for equipment having two or more energy sources. Written procedures communicate important information to persons performing lock-out tag-out. They identify energy sources, provide step-by-step instruction for locking or tagging out energy sources, releasing stored energy, and verifying the equipment cannot be re-started after lockout is applied. Group lock-out tag-out procedures must also be clearly documented. Procedures must be kept up-to-date, and changes must be communicated to everyone who may possibly be affected by them. They are only useful if all the information they contain is correct.

Seven Basic Steps for Lock-out Tag-out

1. Think, plan and check

    1.1. If you are in charge, think through the entire procedure.

    1.2. Identify all parts of any systems that need to be shut down.

    1.3. Determine what switches, equipment and people will be involved.

    1.4. Carefully plan how restarting will take place.

2. Communicate

    2.1. Notify all those who need to know that a lock-out tag-out procedure is taking place.

    2.2. Identify all appropriate power sources, whether near or far from the job site.

    2.3. Include electrical circuits, hydraulic and pneumatic systems, spring energy and gravity systems.

3. Neutralize all appropriate power at the source

    3.1. Disconnect electricity. **Use a voltage detecting instrument to inspect absence of voltage.**

    3.2. Block movable parts.

    3.3. Release or block spring energy.

    3.4. Drain or bleed hydraulic and pneumatic lines.

    3.5. Lower suspended parts to rest positions.

4. Lock out all power sources

    4.1. Use a lock designed only for this purpose.

    4.2. Each worker should have a personal lock.

5. Tag out all power sources and machines

    5.1. Tag machine controls, pressure lines, starter switches and suspended parts.

    5.2. Tags should include your name, department, how to reach you, the date and time of tagging and the reason for the lockout.

6. Do a complete test

    6.1. Double check all the steps above.

    6.2. Do a personal check.

    6.3. Push start buttons, test circuits and operate valves to test the system.

7. When It's Time To Restart

    7.1. After the job is completed, follow the safety procedures you have set up for restart, removing only your own locks and tags. With all workers safe and equipment ready, it's time to turn on the power.

Lock-out Tag-out Resources

1. Federal OSHA page on lock-out tag-out reference

2. NFPA 70E – “Standard for Electrical Safety In The Workplace” – 2004 Edition

Section 15
Excavation Trenching

Scope and Application.

This section applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

Definitions applicable to this subpart.

1. **Accepted engineering practices**-those requirements which are compatible with standards of practice required by a registered professional engineer.

2. **Aluminum Hydraulic Shoring**-a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

3. **Bell-bottom pier hole** - a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

4. **Benching (Benching system)** - a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

5. **Cave-in** - the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or other wise injure and immobilize a person.

6. **Competent person** - one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. All Doster projects must have a trained and qualified competent person on-site during any, and all, excavation work. Subcontractor competent personnel are designated by the subcontractor performing the work.

7. **Cross braces** - the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

8. **Excavation** - any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

9. **Faces or Sides** - the vertical or inclined earth surfaces formed as a result of excavation work.

10. **Failure** - the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

11. **Hazardous atmosphere** - an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

12. **Kickout** - the accidental release or failure of a cross brace.

13. **Protective system** - a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

14. **Ramp** - an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

15. **Registered Professional Engineer** - a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

16. **Sheeting** - the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

17. **Shield (Shield system)** - a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

18. **Shoring (Shoring system)** - a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

19. **Sides** See **Faces**

20. **Sloping (Sloping system)** - a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

21. **Stable rock** - natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

22. **Structural ramp** - a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

23. **Support system** - a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

24. **Tabulated data** - tables and charts approved by a registered professional engineer and used to design and construct a protective system.

25. **Trench (Trench excavation)** - a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

26. **Trench box** See **Shield**

27. **Trench shield** See **Shield**

28. **Uprights** - the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

29. **Wales** - horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

Section 15
OSHA Data - Excavations: Hazard Recgonition in Trenching and Shoring

Introduction

Excavating is recognized as one of the most hazardous construction operations. OSHA recently revised Subpart P, *Excavations,* of 29 CFR 1926.650, .651, and .652 to make the standard easier to understand, permit the use of performance criteria where possible, and provide construction employers with options when classifying soil and selecting employee protection methods.

This chapter is intended to assist *OSHA Technical Manual* users, safety and health consultants, OSHA field staff, and others in the recognition of trenching and shoring hazards and their prevention.

Definitions

1. ACCEPTED ENGINEERING PRACTICES are procedures compatible with the standards of practice required of a registered professional engineer.

2. ADJACENT STRUCTURE STABILITY refers to the stability of the foundation(s) of adjacent structures whose location may create surcharges, changes in soil conditions, or other disruptions that have the potential to extend into the failure zone of the excavation or trench.

3. COMPETENT PERSON is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to employees, and who *has authorization to take prompt corrective measures to eliminate or control these hazards and conditions.*
4. CONFINED SPACE is a space that, by design and/or configuration, has limited openings for entry and exit, unfavorable natural ventilation, may contain or produce hazardous substances, and is not intended for continuous employee occupancy.

5. EXCAVATION. An Excavation is any man-made cut, cavity, trench, or depression in an earth surface that is formed by earth removal. A Trench is a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth of a trench is greater than its width, and the width (measured at the bottom) is not greater than 15 ft (4.6 m). If a form or other structure installed or constructed in an excavation reduces the distance between the form and the side of the excavation to 15 ft (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

6. HAZARDOUS ATMOSPHERE is an atmosphere that by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen-deficient, toxic, or otherwise harmful may cause death, illness, or injury to persons exposed to it.

7. INGRESS AND EGRESS mean "entry" and "exit," respectively. In trenching and excavation operations, they refer to the provision of safe means for employees to enter or exit an excavation or trench.

8. PROTECTIVE SYSTEM refers to a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, and from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

9. REGISTERED PROFESSIONAL ENGINEER is a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer who is registered in any state is deemed to be a "registered professional engineer" within the meaning of Subpart P when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

10. SUPPORT SYSTEM refers to structures such as underpinning, bracing, and shoring that provide support to an adjacent structure or underground installation or to the sides of an excavation or trench.

11. SUBSURFACE ENCUMBRANCES include underground utilities, foundations, streams, water tables, transformer vaults, and geological anomalies.

12. SURCHARGE means an excessive vertical load or weight caused by spoil, overburden, vehicles, equipment, or activities that may affect trench stability.

13. TABULATED DATA are tables and charts approved by a registered professional engineer and used to design and construct a protective system.

14. UNDERGROUND INSTALLATIONS include, but are not limited to, utilities (sewer, telephone, fuel, electric, water, and other product lines), tunnels, shafts, vaults, foundations, and other underground fixtures or equipment that may be encountered during excavation or trenching work.
15. UNCONFINED COMPRESSIVE STRENGTH is the load per unit area at which soil will fail in compression. This measure can be determined by laboratory testing, or it can be estimated in the field using a pocket penetrometer, by thumb penetration tests, or by other methods.

16. DEFINITIONS THAT ARE NO LONGER APPLICABLE. For a variety of reasons, several terms commonly used in the past are no longer used in revised Subpart P.

    These include the following:

    16.1. Angle of Repose Conflicting and inconsistent definitions have led to confusion as to the meaning of this phrase. This term has been replaced by Maximum Allowable Slope.

    16.2. Bank, Sheet Pile, and Walls Previous definitions were unclear or were used inconsistently in the former standard.

    16.3. Hard Compact Soil and Unstable Soil The new soil classification system in revised Subpart P uses different terms for these soil types.

Overview: Soil Mechanics

A number of stresses and deformations can occur in an open cut or trench. For example, increases or decreases in moisture content can adversely affect the stability of a trench or excavation.

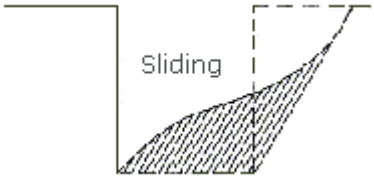
The following diagrams show some of the more frequently identified causes of trench failure.

TENSION CRACKS. Tension cracks usually form at a horizontal distance of 0.5 to 0.75 times the depth of the trench, measured from the top of the vertical face of the trench. See the accompanying drawing for additional details.

FIGURE 5:2-1. TENSION CRACK.

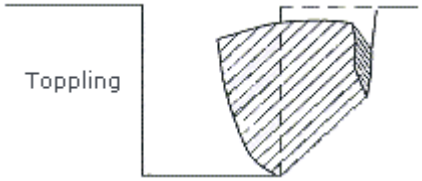
SLIDING or sluffing may occur as a result of tension cracks, as illustrated below.

FIGURE 5:2-2. SLIDING.



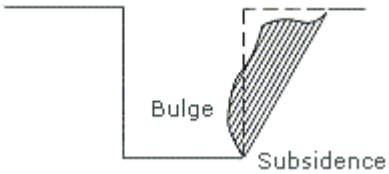
TOPPLING. In addition to sliding, tension cracks can cause toppling. Toppling occurs when the trench's vertical face shears along the tension crack line and topples into the excavation.

FIGURE 5:2-3. TOPPLING.



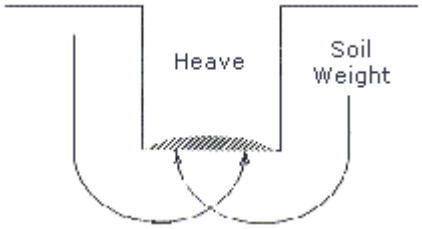
SUBSIDENCE AND BULGING. An unsupported excavation can create an unbalanced stress in the soil, which, in turn, causes subsidence at the surface and bulging of the vertical face of the trench. If uncorrected, this condition can cause face failure and entrapment of workers in the trench.

FIGURE 5:2-4. SUBSIDENCE AND BULGING.



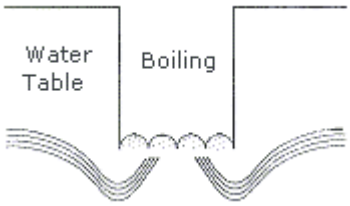
HEAVING OR SQUEEZING. Bottom heaving or squeezing is caused by the downward pressure created by the weight of adjoining soil. This pressure causes a bulge in the bottom of the cut, as illustrated in the drawing above. Heaving and squeezing can occur even when shoring or shielding has been properly installed.

FIGURE 5:2-5. HEAVING OR SQUEEZING.



BOILING is evidenced by an upward water flow into the bottom of the cut. A high water table is one of the causes of boiling. Boiling produces a "quick" condition in the bottom of the cut, and can occur even when shoring or trench boxes are used.

FIGURE 5:2-6. BOILING.



UNIT WEIGHT OF SOILS refers to the weight of one unit of a particular soil. The weight of soil varies with type and moisture content. One cubic foot of soil can weigh from 110 pounds to 140 pounds or more, and one cubic meter (35.3 cubic feet) of soil can weigh more than 3,000 pounds.

Determination of soil type

OSHA categorizes soil and rock deposits into four types, 1 through 5, as follows:

1. STABLE ROCK is natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed. It is usually identified by a rock name such as granite or sandstone. Determining whether a deposit is of this type may be difficult unless it is known whether cracks exist and whether or not the cracks run into or away from the excavation.

2. TYPE “A” SOILS are cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) (144 kPa) or greater. Examples of Type A cohesive soils are often: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. (No soil is Type A if it is fissured, is subject to vibration of any type, has previously been disturbed, is part of a sloped, layered system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical (4H:1V) or greater, or has seeping water.

3. TYPE B SOILS are cohesive soils with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa). Examples of other Type B soils are: angular gravel; silt; silt loam; previously disturbed soils unless otherwise classified as Type C; soils that meet the unconfined compressive strength or cementation requirements of Type A soils but are fissured or subject to vibration; dry unstable rock; and layered systems sloping into the trench at a slope less than 4H:1V (only if the material would be classified as a Type B soil).

4. TYPE C SOILS are cohesive soils with an unconfined compressive strength of 0.5 tsf (48 kPa) or less. Other Type C soils include granular soils such as gravel, sand and loamy sand, submerged soil, soil from which water is freely seeping, and submerged rock that is not stable. Also included in this classification is material in a sloped, layered system where the layers dip into the excavation or have a slope of four horizontal to one vertical (4H:1V) or greater.

5. LAYERED GEOLOGICAL STRATA. Where soils are configured in layers, i.e., where a layered geologic structure exists, the soil must be classified on the basis of the soil classification of the weakest soil layer. Each layer may be classified individually if a more stable layer lies below a less stable layer, i.e., where a Type C soil rests on top of stable rock.

Test Equipment and Methods for Evaluating Soil Type

Many kinds of equipment and methods are used to determine the type of soil prevailing in an area, as described below.

1. POCKET PENETROMETER. Penetrometers are direct-reading, spring-operated instruments used to determine the unconfined compressive strength of saturated cohesive soils. Once pushed into the soil, an indicator sleeve displays the reading. The

instrument is calibrated in either tons per square foot (tsf) or kilograms per square centimeter (kPa). However, Penetrometers have error rates in the range of ± 20-40%.

1.1. Shearvane (Torvane). To determine the unconfined compressive strength of the soil with a shearvane, the blades of the vane are pressed into a level section of undisturbed soil, and the torsional knob is slowly turned until soil failure occurs. The direct instrument reading must be multiplied by 2 to provide results in tons per square foot (tsf) or kilograms per square centimeter (kPa).

1.2. Thumb Penetration Test. The thumb penetration procedure involves an attempt to press the thumb firmly into the soil in question. If the thumb makes an indentation in the soil only with great difficulty, the soil is probably Type A. If the thumb penetrates no further than the length of the thumb nail, it is probably Type B soil, and if the thumb penetrates the full length of the thumb, it is Type C soil. The thumb test is subjective and is therefore the least accurate of the three methods.

1.3. Dry Strength Test. Dry soil that crumbles freely or with moderate pressure into individual grains is granular. Dry soil that falls into clumps that subsequently break into smaller clumps (and the smaller clumps can be broken only with difficulty) is probably clay in combination with gravel, sand, or silt. If the soil breaks into clumps that do not break into smaller clumps (and the soil can be broken only with difficulty), the soil is considered unfissured unless there is visual indication of fissuring.

2. PLASTICITY OR WET THREAD TEST. This test is conducted by molding a moist sample of the soil into a ball and attempting to roll it into a thin thread approximately 1/8 inch (3 mm) in diameter (thick) by 2 inches (50 mm) in length. The soil sample is held by one end. If the sample does not break or tear, the soil is considered cohesive.

3. VISUAL TEST. A visual test is a qualitative evaluation of conditions around the site. In a visual test, the entire excavation site is observed, including the soil adjacent to the site and the soil being excavated. If the soil remains in clumps, it is cohesive; if it appears to be coarse-grained sand or gravel, it is considered granular. The evaluator also checks for any signs of vibration.

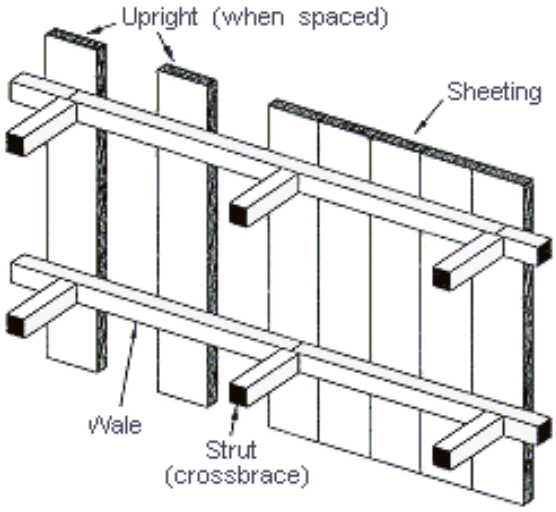
During a visual test, the evaluator should check for crack-line openings along the failure zone that would indicate tension cracks, look for existing utilities that indicate that the soil has previously been disturbed, and observe the open side of the excavation for indications of layered geologic structuring.

The evaluator should also look for signs of bulging, boiling, or sluffing, as well as for signs of surface water seeping from the sides of the excavation or from the water table. If there is standing water in the cut, the evaluator should check for "quick" conditions (see Paragraph III. F. in this chapter). In addition, the area adjacent to the excavation should be checked for signs of foundations or other intrusions into the failure zone, and the evaluator should check for surcharging and the spoil distance from the edge of the excavation.

Shoring Types

Shoring is the provision of a support system for trench faces used to prevent movement of soil, underground utilities, roadways, and foundations. Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. Shoring systems consist of posts, wales, struts, and sheeting. There are two basic types of shoring, timber and aluminum hydraulic.

FIGURE V:2-7. TIMBER SHORING.



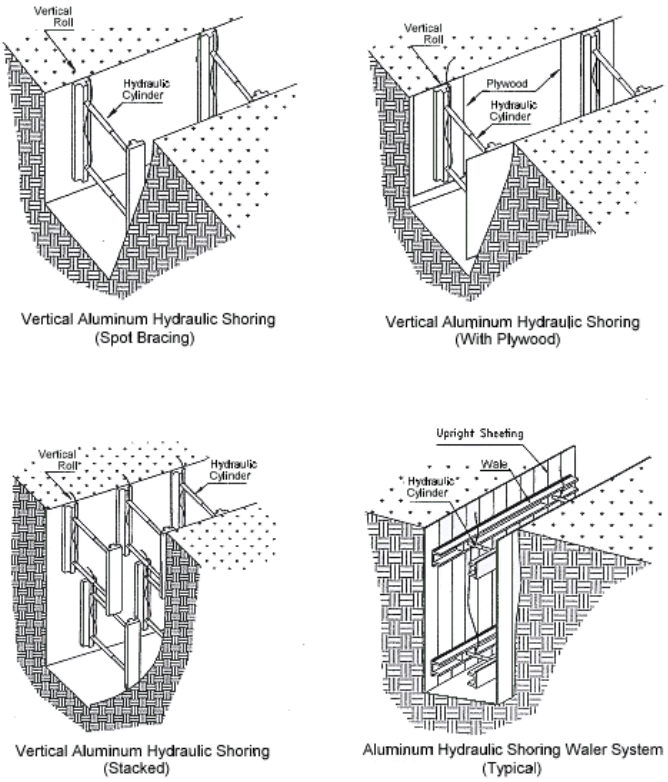
1. HYDRAULIC SHORING. The trend today is toward the use of hydraulic shoring, a prefabricated strut and/or wale system manufactured of aluminum or steel. Hydraulic shoring provides a critical safety advantage over timber shoring because workers do not have to enter the trench to install or remove hydraulic shoring.

   Other advantages of most hydraulic systems are that they:

   1.1. Are light enough to be installed by one worker;
   1.2. Are gauge-regulated to ensure even distribution of pressure along the trench line;
   1.3. Can have their trench faces "preloaded" to use the soil's natural cohesion to prevent movement; and
   1.4. Can be adapted easily to various trench depths and widths.

All shoring should be installed from the top down and removed from the bottom up. Hydraulic shoring should be checked at least once per shift for leaking hoses and/or cylinders, broken connections, cracked nipples, bent bases, and any other damaged or defective parts.

FIGURE V:2-8. SHORING VARIATIONS: TYPICAL ALUMINUM HYDRAULIC SHORING INSTALLATIONS.



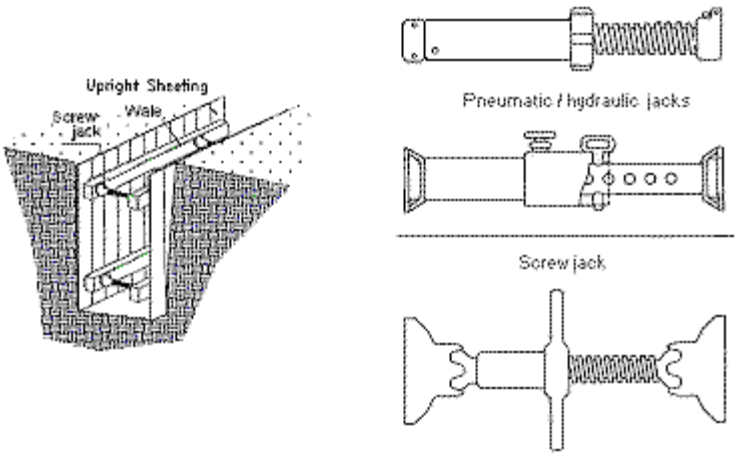
2. PNEUMATIC SHORING works in a manner similar to hydraulic shoring. The primary difference is that pneumatic shoring uses air pressure in place of hydraulic pressure. A disadvantage to the use of pneumatic shoring is that an air compressor must be on site.

2.1. Screw Jacks. Screw jack systems differ from hydraulic and pneumatic systems in that the struts of a screw jack system must be adjusted manually. This creates a hazard because the worker is required to be in the trench in order to adjust the strut. In addition, uniform "preloading" cannot be achieved with screw jacks, and their weight creates handling difficulties.

2.2. Single-Cylinder Hydraulic Shores. Shores of this type are generally used in a water system, as an assist to timber shoring systems, and in shallow trenches where face stability is required.

2.3. Underpinning. This process involves stabilizing adjacent structures, foundations, and other intrusions that may have an impact on the excavation. As the term indicates, underpinning is a procedure in which the foundation is physically reinforced. Underpinning should be conducted only under the direction and with the approval of a registered professional engineer.

FIGURE V:2-9. SHORING VARIATIONS.



Shielding Types

1. TRENCH BOXES are different from shoring because, instead of shoring up or otherwise supporting the trench face, they are intended primarily to protect workers from cave-ins and similar incidents. The excavated area between the outside of the trench box and the face of the trench should be as small as possible. The space between the trench boxes and the excavation side are backfilled to prevent lateral movement of the box. Shields may not be subjected to loads exceeding those which the system was designed to withstand.

FIGURE V:2-10. TRENCH SHIELD.

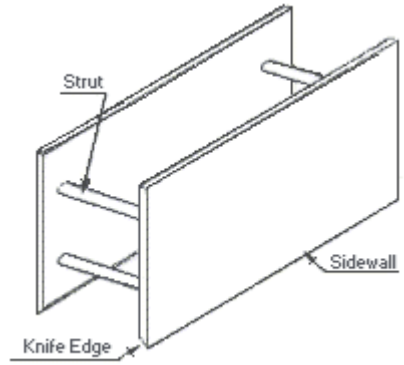
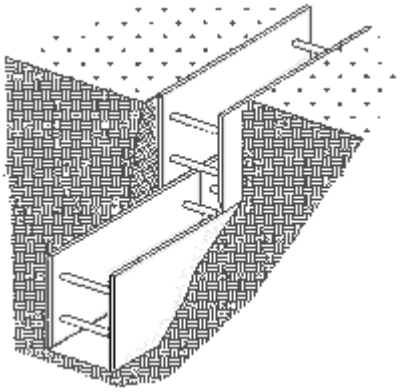


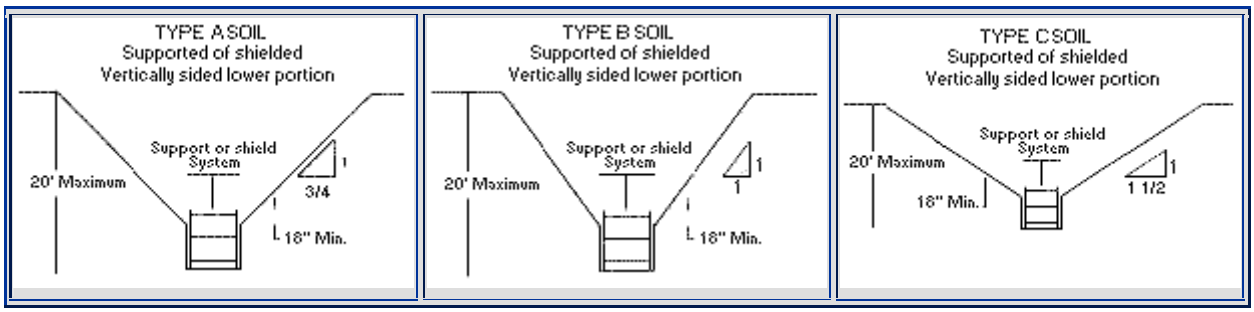
FIGURE V:2-11. TRENCH SHIELD, STACKED.



2. COMBINED USE. Trench boxes are generally used in open areas, but they also may be used in combination with sloping and benching. The box should extend at least 18 in (0.45 m) above the surrounding area if there is sloping toward excavation. This can be accomplished by providing a benched area adjacent to the box.

Earth excavation to a depth of 2 ft (0.61 m) below the shield is permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench and there are no indications while the trench is open of possible loss of soil from behind or below the bottom of the support system. Conditions of this type require observation on the effects of bulging, heaving, and boiling as well as surcharging, vibration, adjacent structures, etc., on excavating below the bottom of a shield. Careful visual inspection of the conditions mentioned above is the primary and most prudent approach to hazard identification and control.

FIGURE V:2-12. SLOPE AND SHIELD CONFIGURATIONS



Sloping and Benching

1. SLOPING. Maximum allowable slopes for excavations less than 20 ft (6.09 m) based on soil type and angle to the horizontal are as follows:

TABLE V:2-1. ALLOWABLE SLOPES.

Soil type	Height/Depth ratio	Slope angle
Stable Rock	Vertical	90°
Type A	¾:1	53°
Type B	1:1	45°
Type C	1½:1	34°
Type A (short-term)	½:1	63°
(For a maximum excavation depth of 12 ft)		

FIGURE V:2-13. SLOPE CONFIGURATIONS: EXCAVATIONS IN LAYERED SOILS.

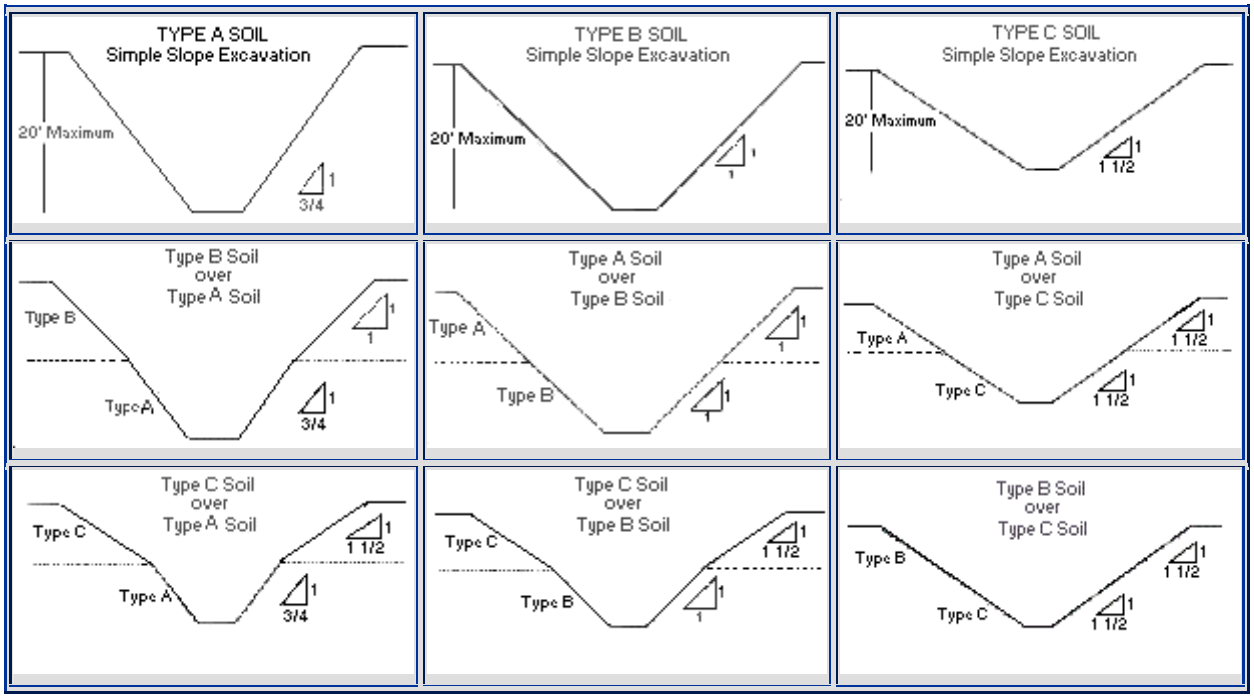
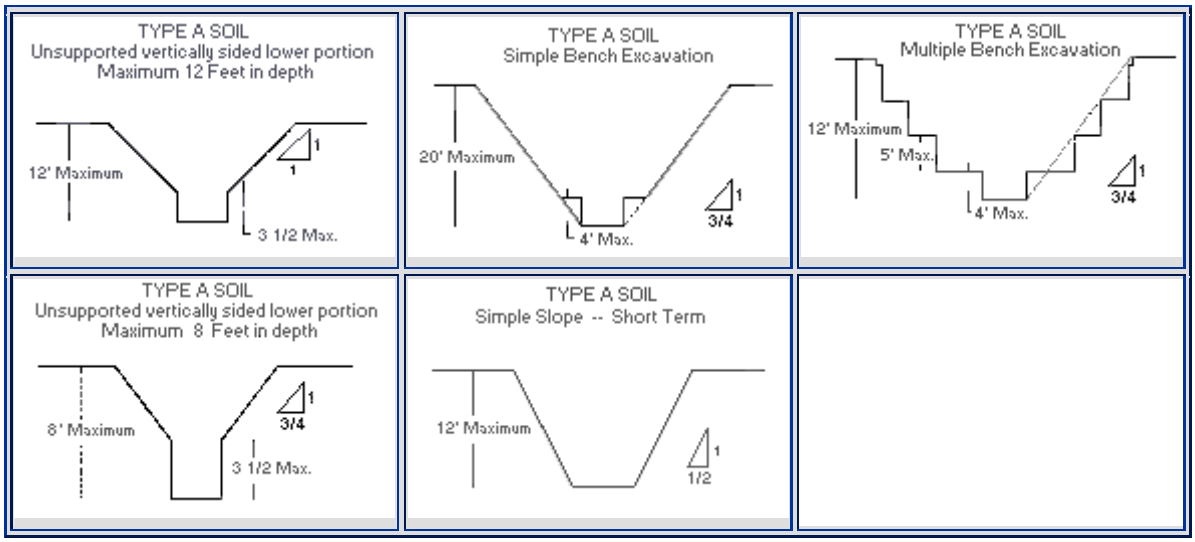


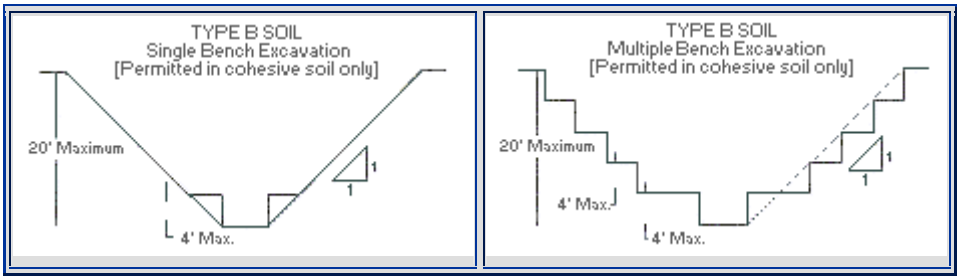
FIGURE V:2-14. EXCAVATIONS MADE IN TYPE A SOIL



2. BENCHING. There are two basic types of benching, simple and multiple. The type of soil determines the horizontal to vertical ratio of the benched side.

As a general rule, the bottom vertical height of the trench must not exceed 4 ft (1.2 m) for the first bench. Subsequent benches may be up to a maximum of 5 ft (1.5 m) vertical in Type A soil and 4 ft (1.2 m) in Type B soil to a total trench depth of 20 ft (6.0 m). All subsequent benches must be below the maximum allowable slope for that soil type. For Type B soil the trench excavation is permitted in cohesive soil only.

FIGURE V:2-15. EXCAVATIONS MADE IN TYPE B SOIL

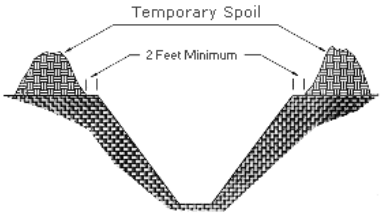


Spoil

1. TEMPORARY SPOIL. Temporary spoil must be placed no closer than 2 ft (0.61 m) from the surface edge of the excavation, measured from the nearest base of the spoil to the cut. This distance should not be measured from the crown of the spoil deposit. This distance requirement ensures that loose rock or soil from the temporary spoil will not fall on employees in the trench.

Spoil should be placed so that it channels rainwater and other run-off water away from the excavation. Spoil should be placed so that it cannot accidentally run, slide, or fall back into the excavation.

FIGURE V: 2-16. TEMPORARY SPOIL



2. PERMANENT SPOIL. Permanent spoil should be placed at some distance from the excavation. Permanent spoil is often created where underpasses are built or utilities are buried. The improper placement of permanent spoil, i.e. insufficient distance from the working excavation, can cause an excavation to be out of compliance with the horizontal-to-vertical ratio requirement for a particular excavation. This can usually be determined through visual observation. Permanent spoil can change undisturbed soil to disturbed soil and dramatically alter slope requirements.

Additional Safety, Health and Environmental Considerations and Requirements

1. COMPETENT PERSON. The designated competent person should have and be able to demonstrate the following: (The competent person is designated by the subcontractor).

    1.1. Training, experience, and knowledge of:
        1.1.1. soil analysis;
        1.1.2. use of protective systems; and
        1.1.3. requirements of 29 CFR Part 1926 Subpart P.

    1.2. Ability to detect:
        1.2.1 conditions that could result in cave-ins;
        1.2.2. failures in protective systems;
        1.2.3. hazardous atmospheres;
        1.2.4. environmental impact; and
        1.2.5. other hazards including those associated with confined spaces.

    1.3. Authority to take prompt corrective measures to eliminate existing and predictable hazards and to stop work when required.

2. SURFACE CROSSING OF TRENCHES. Surface crossing of trenches should be discouraged; however, if trenches must be crossed, such crossings are permitted only under the following conditions:

    2.1. Vehicle crossings must be designed by and installed under the supervision of a registered professional engineer.

    2.2. Walkways or bridges must be provided for foot traffic. These structures shall:
        2.2.1. have a safety factor of 4;

2.2.2. have a minimum clear width of 20 in (0.51 m);
2.2.3. be fitted with standard rails; and
2.2.4 extend a minimum of 24 in (.61 m) past the surface edge of the trench.

3. INGRESS AND EGRESS. Access to and exit from the trench require the following conditions:

3.1. Trenches 4 ft or more in depth should be provided with a fixed means of egress.

3.2. Spacing between ladders or other means of egress must be such that a worker will not have to travel more than 25 ft laterally to the nearest means of egress.

3.3. Ladders must be secured and extend a minimum of 36 in (0.9 m) above the landing.

3.4. Metal ladders should be used with caution, particularly when electric utilities are present.

4. EXPOSURE TO VEHICLES. Procedures to protect employees from being injured or killed by vehicle traffic include:

4.1. Providing employees with and requiring them to wear warning vests or other suitable garments marked with or made of reflectorized or high-visibility materials.

4.2. Requiring a designated, trained flagperson along with signs, signals, and barricades when necessary.

5. EXPOSURE TO FALLING LOADS. Employees must be protected from loads or objects falling from lifting or digging equipment.

   Procedures designed to ensure their protection include:

   5.1. Employees are not permitted to work under raised loads.

   5.2. Employees are required to stand away from equipment that is being loaded or unloaded.

   5.3. Equipment operators or truck drivers may stay in their equipment during loading and unloading if the equipment is properly equipped with a cab shield or adequate canopy.

6. WARNING SYSTEMS FOR MOBILE EQUIPMENT. The following steps should be taken to prevent vehicles from accidentally falling into the trench:

   6.1. Barricades must be installed where necessary.

   6.2. Hand or mechanical signals must be used as required.

   6.3. Stop logs must be installed if there is a danger of vehicles falling into the trench.

   6.4. Soil should be graded away from the excavation; this will assist in vehicle control and channeling of run-off water.

7. HAZARDOUS ATMOSPHERES AND CONFINED SPACES. Employees shall not be permitted to work in hazardous and/or toxic atmospheres. Such atmospheres include those with:

   7.1. Less than 19.5% or more than 23.5% oxygen;

   7.2. A combustible gas concentration greater than 20% of the lower flammable limit; and

   7.3. Concentrations of hazardous substances that exceed those specified in the *Threshold Limit Values for Airborne Contaminants* established by the ACGIH (American Conference of Governmental Industrial Hygienists).

All operations involving such atmospheres must be conducted in accordance with OSHA requirements for occupational health and environmental controls (see Subpart D of 29 CPR 1926) for personal protective equipment and for lifesaving equipment (see Subpart E, 29 CFR 1926). Engineering controls (e.g., ventilation) and respiratory protection may be required.

When testing for atmospheric contaminants, the following should be considered:

7.4. Testing should be conducted before employees enter the trench and should be done regularly to ensure that the trench remains safe.

7.5. The frequency of testing should be increased if equipment is operating in the trench.

7.6. Testing frequency should also be increased if welding, cutting, or burning is done in the trench.

Employees required to wear respiratory protection must be trained, fit-tested, and enrolled in a respiratory protection program. Some trenches qualify as confined spaces. When this occurs, compliance with the Confined Space Standard is also required.

8. EMERGENCY RESCUE EQUIPMENT. Emergency rescue equipment is required when a hazardous atmosphere exists or can reasonably be expected to exist. Requirements are as follows:

8.1. Respirators must be of the type suitable for the exposure. Employees must be trained in their use and a respirator program must be instituted.

8.2. Attended (at all times) lifelines must be provided when employees enter bell-bottom pier holes, deep confined spaces, or other similar hazards.

8.3. Employees who enter confined spaces must be trained.

9. STANDING WATER AND WATER ACCUMULATION. Methods for controlling standing water and water accumulation must be provided and should consist of the following if employees are permitted to work in the excavation:

    9.1. Use of special support or shield systems approved by a registered professional engineer.

    9.2. Water removal equipment, i.e. well pointing, used and monitored by a competent person.

    9.3. Safety harnesses and lifelines used in conformance with 29 CFR 1926.104.

    9.4. Surface water diverted away from the trench.

    9.5. Employees removed from the trench during rainstorms.

    9.6. Trenches carefully inspected by a competent person after each rain and before employees are permitted to re-enter the trench.

10. UNCOVERING UNDERGROUND MATERIALS OR SUBSTANCES. During the process of excavating, employees may encounter underground materials, substances that may have leaked from previous site activity. Several steps need to be taken for identifying, controlling, eliminating and/or minimizing the impact on the health of employees and the environment.

    10.1. Any uncovered material or substances needs to be identified before work on the excavation or trench may proceed. Any identification of material or substance shall be performed by means that do not put employees at risk.

    10.2. If material or substance is identifiable the MSDS shall be obtained to follow the proper requirements of retrieval and disposal – based on the guidelines established on Section 8 – Emergency Response / Action Plan on this manual (refer to Spills and Leaks)

    10.3. If material or substance cannot be identified a third party environmental company shall be contacted for the proper identification, retrieval and disposal of material or substance.

11. INSPECTIONS. Inspections shall be made by a competent person and should be documented. The following guide specifies the frequency and conditions requiring inspections:

    10.1. Daily and before the start of each shift;

    10.2. As dictated by the work being done in the trench;

    10.3. After every rainstorm;

    10.4. After other events that could increase hazards, e.g. snowstorm, windstorm, thaw, earthquake, etc.;

    10.5. When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom, or other similar conditions occur;

    10.6. When there is a change in the size, location, or placement of the spoil pile; and

    10.7. When there is any indication of change or movement in adjacent structures.

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Appendix V: 2-1. Site Assessment Questions

During first and subsequent visits to a construction or facility maintenance location, the compliance officer (or the site's safety officer or other competent person) may find the following questions useful.

1. Is the cut, cavity, or depression a trench or an excavation?
2. Is the cut, cavity, or depression more than 4 ft (1.2 m) in depth?
3. Is there water in the cut, cavity, or depression?
4. Are there adequate means of access and egress?
5. Are there any surface encumbrances?
6. Is there exposure to vehicular traffic?
7. Are adjacent structures stabilized?
8. Does mobile equipment have a warning system?
9. Is a competent person in charge of the operation?
10. Is equipment operating in or around the cut, cavity, or depression?
11. Are procedures required to monitor, test, and control hazardous atmospheres?
12. Does a competent person determine soil type?
13. Was a soil testing device used to determine soil type?
14. Is the spoil placed 2 ft (0.6 m) or more from the edge of the cut, cavity, or depression?
15. Is the depth 20 ft (6.1 m) or more for the cut, cavity, or depression?
16. Has a registered professional engineer approved the procedure if the depth is more than 20 ft (6.1 m)?
17. Does the procedure require benching or multiple benching? Shoring? Shielding?
18. If provided, do shields extend at least 18 in (0.5 m) above the surrounding area if it is sloped toward the excavation?
19. If shields are used, is the depth of the cut more than 2 ft (0.6 m) below the bottom of the shield?
20. Are any required surface crossings of the cut, cavity, or depression the proper width and fitted with hand rails?
21. Are means of egress from the cut, cavity, or depression no more than 25 ft (7.6m) from the work?
22. Is emergency rescue equipment required?
23. Is there documentation of the minimum daily excavation ins*pection*?

Section 16
Confined Space

OSHA regulation - **P**ermit-**R**equired **C**onfined **S**paces (29 CFR 1910.146) defines a confined space as:

1) a space that is large enough and so configured to permit entry and work

2) a space that is not designed for continuous human occupancy

3) a space that by design has limited or restricted means for entry and exit

When an area has all three of the above characteristics, it is considered to be a confined space that is subject to regulation by the OSHA standard. It is important to note that failure to satisfy one of the above criteria means that it is not a confined space according to OSHA's definition, and therefore not subject to the new standard. However, there are documented circumstances that have resulted in injury or death, when not all of the above conditions have been satisfied. These incidents could have been prevented if there was a better awareness of confined space hazards. Do not be overly constrained by the technicalities of the definition; if it looks like a confined space, treat it like one until the hazards have been fully assessed and the potential for risk has been determined.

Since the essence of the regulation is embodied in the requirements for Permit Required Confined Spaces (PRCS), let's review what makes a confined space a PRCS. A PRCS is a space that meets the definition of a confined space above, **and** has *one or more* of the following hazardous characteristics:

1) contains or has the potential to contain a hazardous atmosphere (oxygen, flammability, and toxicity)

2) contains a liquid or finely-divided solid material, that could surround or engulf (frequently associated with loose material, like grains)

3) has an internal shape that could cause entrapment (caused by inwardly sloping walls)

4) contains other recognized serious safety or health hazards (such as temperature extremes, mechanical, electrical)

The regulation applies to all permit-required confined spaces. Examples include tanks, vats, silos, storage bins, process or reactor vessels, vaults, sewers and pits, machinery enclosures, boilers, and rail tank cars. OSHA requires that an employer prepare a written confined space safety program that addresses the precautions to be taken for entering and working in permit-required confined spaces.

The written PRCS program contains a number of key elements that must be addressed, which are summarized in the following list:

1) identify and classify all spaces (permit or non-permit)

2) take steps to prevent unauthorized entry and notify employees that spaces exist

3) develop procedures and practices for safe entry activities, including control measures (such as isolation, ventilation, and periodic atmospheric testing for changing conditions)

4) perform atmospheric monitoring to determine if acceptable entry conditions exist

5) establish key personnel to implement program - entrant, attendant, entry supervisor, atmospheric tester, and emergency response - and define responsibilities and training requirements

6) conduct training to ensure all workers have understanding, knowledge, and skills

7) establish and implement a permit system for entry and work that includes provisions for canceling the permit and returning a space to service

8) develop procedures that address safety of contractor personnel when involved in confined space situations

9) establish procedures for rescue and emergency services

10) provide specialized equipment such as atmospheric monitoring, ventilation, PPE, lighting, communication, and emergency/rescue equipment

The Doster Construction Company PRCS program addresses these elements and must be followed by any employee entering a confined space.

Section 17
Hazard Communication Program

Purpose

The purpose of the Hazard Communication Program is to inform Doster Construction Company employees and subcontractor employees of known chemical hazards that may exist in the work place. Every day, numerous different chemical substances are handled by Doster employees around our jobsites. For many of these employees, the routine handling of chemicals is an important and integral part of their normal work requirements. For these employees, knowledge of the hazards associated with the chemicals is extremely important as well as safe handling procedures, protective equipment and emergency procedures.

Scope

Chemical substances vary greatly in the degree and type of hazard they may pose under certain defined conditions. Some materials pose a severe fire or explosion potential but show little ability to produce adverse health effects. Other materials may pose very little fire hazards, but may be highly toxic if inhaled, ingested or come in contact with the skin. Other materials, such as certain compressed gases, may pose little health or fire hazard, but due to the physical characteristics, pressurized storage can be dangerous if mishandled. It is very important that all Doster Construction Company employees and our subcontractor employees understand the variety of hazards associated with materials with which they may contact.

The communication of information to employees in order to protect their health and well being is a vital priority at Doster Construction Company. Over the years, Doster has continued to develop programs, which help to provide necessary information to our employees and subcontractors. This written program has been prepared in compliance with the Hazard Communication Standard (29 CFR 1019.1200) to insure that employees who must work with hazardous substances are informed of these hazards as well as of appropriate and safe methods of handling. The Hazard Communication Program letter to all employees shall be posted in a conspicuous place, i.e. project bulletin board. This provides a quick reference for employees as to where the program is located and the individual responsible for administrating the program.

The Doster Site Superintendent will be responsible for the coordination of the Hazard Communication program for all contractors and subcontractors working on the project contracted to Doster Construction Company. Contractors shall provide Doster with a copy of their project specific Hazard Communication Program including all applicable Material safety Data Sheets prior to mobilizing on site.

Each contractor shall provide the Doster Project Superintendent with a copy of the Material Safety Data Sheet for any new chemical that is to be introduced on site prior to bringing the chemical on site. All employees that could be potentially affected by the chemical shall receive training on all physical and health hazards, visual appearance and odors associated with the chemical, protective measures, monitoring devices, personal protective equipment and emergency procedures.

The Doster Project Superintendent will be responsible for maintaining all contractor Hazard Communication Programs and Material Safety Data Sheet for all chemicals brought on site. These will be made available, upon request to employees, their designated representatives and the OSHA Assistant Secretary and the Director in accordance with the requirements of 29 CFR 1910.1020(e).

Program Summary

The major elements of this program are as follows:

1. Labels and other forms of warning
2. Material Safety Data Sheets (MSDS): Doster, subcontractor(s) and client
3. Employee training
4. Hazardous chemical inventory list
5. Methods of informing employees of hazards of non-routine tasks
6. Methods for informing subcontractor employees

Labels and Other Forms of Warning

The OSHA Standards require that every container in the work place, which contains a hazardous substance or mixture, be identified as to such contents and hazards.

1. Hazard Definitions

1.1 Physical Hazards

- Flammable
- Combustible
- Oxidizer
- Pyrophoric, explosive or unstable
- Water reactive
- Compressed gas

1.2 Health Hazards

- Carcinogenic, mutrogenic or tetrogenic
- Courses target organ effects (dermatitis, eye damage, reproductive effects, neurotoxins, systemic toxicants, etc.)
- Toxic or highly toxic
- Corrosive
- Irritant
- Sentizer

Every container containing a hazardous chemical will be marked or labeled so that a rapid determination of content identity as well as hazards can be made. This includes drums, pails, buckets, and portable tanks.

2. Labeling Responsibilities

2.1 It is the receiving Supervisor's responsibility to insure all containers coming on site are labeled properly:

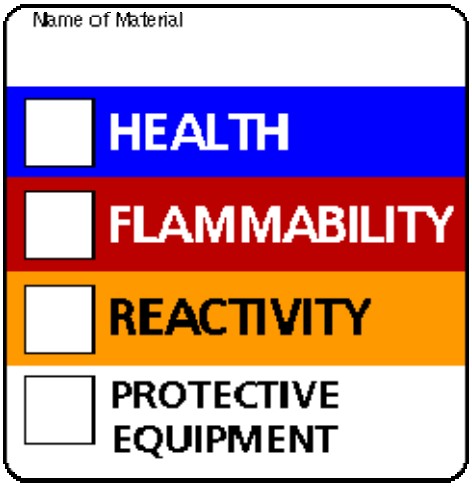
- Product Identity
- Appropriate hazard warning statement(s)
- Manufacturer or responsible party

2.2 It is the responsibility of every Doster employee to insure that container labels or other means of container identification remain affixed to the container and to notify his Supervisor immediately if the information has been removed or otherwise not available.

2.3 It is the responsibility of the employee transferring a material from one container (i.e., portable tank) into another container (drums, buckets, pails, bags, bottles, cans, etc.) to label the content of the container.

2.4 The Hazardous Material Identification (HMI) Label does not list specific hazards, but serves as an immediate identification of hazards and appropriate protective equipment. The HMI Label utilizes a color code, hazard numerical rating system and alphabetical protective equipment code index.

Hazard Color and Numerical Rating Index (sample)



Health: Color – Blue

4.	**EXTREME:**	Highly Toxic--May be fatal on short-term exposure. Special protective equipment required
3.	**SERIOUS:**	Toxic--Avoid inhalation or skin contact
2.	**MODERATE:**	Moderately Toxic-may be harmful if inhaled or absorbed
1.	**SLIGHT:**	Slightly Toxic--May cause slight irritation
0.	**MINIMAL:**	All chemicals have some degree of toxicity

Flammability: Color – Red

4.	**EXTREME:**	Extremely flammable gas or liquid--Flash Point below 73F
3.	**SERIOUS:**	Flammable--Flash Point 73F to 100F
2.	**MODERATE:**	Combustible--Requires moderate heating to ignite
1.	**SLIGHT:**	Slightly Combustible--requires strong heating to ignite
0.	**MINIMAL:**	Will not burn under normal conditions

Reactivity: Color – Yellow

4.	**EXTREME:**	Explosive at room temperature
3.	**SERIOUS:**	May explode if shocked, heated under confinement or mixed with water
2.	**MODERATE:**	Unstable, may react with water
1.	**SLIGHT:**	May react if heated or mixed with water
0.	**MINIMAL:**	Normally stable, does not react with water

Protective Equipment Guide

A. Safety Glasses
B. Safety Glasses, Gloves
C. Safety Glasses, Gloves, Synthetic Apron
D. Face Shield, Gloves, Synthetic Apron
E. Safety Glasses, Gloves, Dust Respirator
F. Safety Glasses, Gloves, Synthetic Apron, Dust Respirator
G. Safety Glasses, Gloves, Dust and Vapor Respirator
H. Safety Glasses, Gloves, Synthetic Apron, Dust and Vapor Respirator
I. Safety Glasses, Gloves, Vapor Respirator
J. Splash Goggles, Gloves, Synthetic Apron, Vapor Respirator
K. Air Line Head or Mask, Gloves, Full Suit, Boots
L. Ask your Supervisor for special handling instructions

Material Safety Data Sheets

It will be the Project Superintendent's responsibility to maintain all contractor's Hazardous Communication Programs and corresponding Material Safety Data Sheets for all hazardous chemicals brought on site.

The Superintendent will be responsible for determining the location of all the Material Safety Data Sheet file(s) and conveying this information to all Doster and associated subcontractor employees.

If an employee discovers that an MSDS is not available for a particular chemical, he/she is to bring this immediately to the attention of his/her Supervisor. The Supervisor and or employee should inform the Superintendent. The Superintendent will determine if a MSDS is required. If required, the Superintendent shall contact the subcontractor and/ or manufacturer requesting a copy of the MSDS be faxed or express mailed to the project.

Training and Information

Once a month all Doster Construction Company jobsites will perform their Weekly Site Safety Talk with the sole focus on Hazardous Materials and Material Safety Data Sheets (MSDS). All jobsites employees (subcontractors and Doster) will be in attendance as required by Section 7 – Safety Meeting – Requirements in this manual.

Employees, during this meeting, will be given information and instructions on Hazard Communication and MSDS, including but not limited to the following:

- Doster Construction Company Hazard Communication Program
- Labeling System and requirements
- Location and availability of MSDS files specific to their jobsite
- Protective equipment
- Non-routine task

Site Superintendents and/or designee will utilize the Hazard Communication Compliance Guideline as a tool for their monthly Hazard Communication and MSDS training.

This training will be documented on the Superintendent Safety Meeting Sign-In Roster.

Employees will receive additional instructions on non-routine tasks, new hazardous chemicals and/or processes introduced to the project and protective measures at the work site by means of focused safety meeting and/or safety classes.

Definition: The term "employee" is considered to be any employee of Doster Construction Company, contractor, subcontractor or client, that could be potentially affected by the chemical or process.

Hazard Communication Program Letter

TO: ALL EMPLOYEES
From: Hazard Communication Program

NOTICE IS HEREBY GIVEN TO ALL EMPLOYEES:

1. Doster Construction Company is required by 29 CFR 1926.59 to have a Hazard Communication Program. A copy of this program is available to be reviewed by employees at this location, and the person to explain the program is also identified in Item #3.

   Project Name & Code:_____

2. A list of hazardous chemicals known to be present in the work area is available for review by employees during each work shift at this location in the project.

3. The person responsible for the Hazard Communication Program on this project is:

   _____
   Doster Construction Company Superintendent

   _____
   Telephone

4. The Corporate Safety Director will also answer any questions concerning the Doster Construction Company Hazard Communication Program.

   _____
   Doster Construction Company
   Corporate Safety Director

   _____
   Telephone

THIS NOTICE WILL REMAIN POSTED AND VISIBLE TO EMPLOYEES.

MONTHLY HAZARD COMMUNICATION TRAINING

General

Doster Construction Company is a progressive quality management leader in employee safety and health. In keeping with this responsibility and to comply with the "Employee's Right to Know" laws, Doster has instituted a Hazard Communication Program.

Approximately 25 million workers, about one in four in the nation's work force, use one or more chemicals in the work place. There are an estimated 570,000 existing chemical products and hundreds of new ones being introduced annually.

Chemicals can produce both good and bad effects. When chemicals are used properly, they can improve our lives at home and at work. If chemicals are used improperly, potential problems may arise.

To ensure the proper use of chemicals or other potentially harmful materials, the Occupational Safety and Health Administration (OSHA) has developed a Hazard Communication Standard. This standard became effective throughout the United States on May 23, 1988.

Purpose

The purpose of the Hazard Communication Standards is to reduce the potential for illnesses and injuries by training and educating workers to safely work with chemicals and materials that could be potentially hazardous if misused or abused.

The OSHA standard basically requires a written program to list materials, obtain Material Safety Data Sheets (MSDS), label containers, annually train employees, and make this information available to employees, their representatives, and health professionals.

Material Safety Data Sheet (MSDS)

Material Safety Data Sheet (MSDS) is a fact sheet containing important health and safety information about chemicals in your work place. An MSDS for each chemical in your work place is available for your reference.

Employers will maintain copies of any MSDSs that are received with incoming shipments of the sealed containers of hazardous chemicals, will obtain an MSDS for sealed containers of hazardous chemicals received without an MSDS, and will ensure that the MSDSs are readily accessible during each work shift to employees.

Employers will ensure that employees are aware of any operations in their work area where hazardous chemicals are present and the location and availability of the written Hazard Communication Program including the list of hazardous chemicals and MSDSs.

Material Safety Data Sheet Sections

Section I — This section gives the manufacturer's name, various addresses and phone numbers, and chemical names and synonyms.

Section II — This section contains a listing of hazardous ingredients and the PEL melting point, appearance, and odor.

Section III — Chemical Characteristics - This section will include boiling point, melting point, appearance, and odor.

Section IV — Fire and Explosion Data - This section is very important. It will give the flash point, extinguishing agents, and unusual fire and explosion hazards.

Section V — Reactivity Data - This section will explain what the chemical will and will not react with.

Section VI — Health Hazard Data - This section is most important to the employer and the employee. It contains information on how the chemical/material affects the human body on both a short-term and long-term basis and also on how to treat a person who has been exposed.

Section VII — Control Measure - This section contains information on how and where to use the chemical/material, plus the protective equipment required when working with these agents.

The written Hazard Communication Program will be maintained along with the MSDSs by the Superintendent. MSDSs for all chemicals found on the Job Site will be available upon request for your review.

HAZARD COMMUNICATION COMPLIANCE TRAINING CHECKLIST

- ❑ Has a job specific Haz-Com Program been compiled for the project? Does it include:
  - o Chemical and trade names?
  - o Storage requirements and location of material?
- ❑ Does the project have access to Material Safety Data Sheets (MSDSs)? Identifiable?
- ❑ Do bulk storage containers have standard Hazard Material Identification (HMI) or NFPA labels or manufacturer labels that meet specific requirements?
- ❑ Has an employee training program been developed for the project?
- ❑ Has it been conducted for current, active employees?
- ❑ Do employees know how and where to obtain information on the hazardous chemicals they encounter in the work place?
- ❑ Do the employees know where to find a copy of the project's written Hazard Communication Program?
- ❑ Have project employees been instructed in the reading and interpretation of manufacturer labels and MSDSs?
- ❑ Do employees know and understand the requirements of the OSHA and local hazard communication standards?
- ❑ Have employees been instructed as to the health and physical hazards of work area chemicals?
- ❑ Are employees aware of established emergency procedures?
- ❑ Has all employees training been properly documented and filed for reference?
- ❑ Do employees know what is required of the company?
- ❑ Do employees understand their "Right to Know" privileges?

Attached is a Glossary of Material Safety Data Sheet (MSDS) Terms and Definitions. This glossary of terms and definitions is to be used as a tool for reference by the Doster Construction Company Superintendent.

TERMS AND CONDITIONS

Acute Health Effects:

Changes in your health that occur in a short time period. Immediate changes in your health (such as dizziness, stinging or watery eyes, or breathing difficulty) that are caused by breathing, swallowing, or touching a harmful chemical.

Boiling Point:

The temperature at which a liquid boils or becomes a gas.

CAS Number:

Chemical Abstract Service Number. The Chemical Abstract Service assigns a unique identifying number to every chemical or mixture. This number helps identify chemicals that are very similar or share the same name.

Carcinogen:

Any substance that causes cancer or makes the body more vulnerable to cancer.

Chemical Family:

The larger group of related substances to which a particular chemical belongs. For example, isopropyl alcohol is part of the larger alcohol family. The chemical family can tell you about other substances similar to the one on your Material Safety Data Sheet (MSDS).

Chemical Name or Identity:

The name that a product is sold by. This section of an MSDS also includes a formal chemical or technical name and any other commercial names for this chemical.

Chronic Health Effects:

Changes in your health that take place over a period of weeks, months, or years caused by contact with a harmful chemical. Examples of chronic effects include kidney or liver damage, lung damage, or even cancer.

Conditions to Avoid:

Any conditions that might cause a chemical's substance to change, such as high temperature, water, or sunlight.

Dermatitis:

Skin inflammation characterized by itching and redness of the skin.

Dyspnea:

Difficult breathing, feeling short of breath.

Emphysema:

Disease characterized by difficulty in breathing or coughing that occurs during exertion.

Evaporation Rate:

Tells how quickly a substance becomes a gas by comparing it to either ether, which evaporates quickly, or butyl acetate, which evaporates slowly. A chemical with a high

evaporation rate turns into a vapor or gas easily and poses a greater risk of inhalation and should be used in a well-ventilated room.

Explosive Limits:

The range of gas or vapor concentration (strength or amount) that will burn or explode near a spark, heat, or flame.

Extinguishing Materials:

Materials recommended for use in putting out fires, such as water, foam, alcohol foam, carbon dioxide (CO2), dry chemical, or sand.

Flash Point:

The temperatures at which a liquid or volatile solid gives off a vapor sufficient to form an ignitable mixture with the air near the surface of the liquid.

Hazardous Chemical:

Any chemical that is a physical hazard or a health hazard.

Hazardous Decomposition:

A list of hazardous materials that may be produced if a substance is exposed to heat, flame, oxidation, or other chemicals.

Health Hazards:

Any chemical for which at least one valid scientific study demonstrates that the chemical could cause acute or chronic health problems to exposed employees.

Incompatibility:

A list of substances that cause a chemical to react or change when they are mixed or are in contact.

LD 50:

Lethal dose 50 percent. The amount of substance that will kill 50 percent of the animals receiving it. This dose is usually measured in milligrams per kilogram of body weight.

MSDS:

Material Safety Data Sheet. A fact sheet containing important health and safety information about chemicals in your workplace. An MSDS for each chemical in your workplace is available for reference.

Mutagen:

An agent that causes change in genes. Genetic changes may be inherited by offspring.

NIOSH:

National Institute for Occupational Safety and Health. A research group that recommends substances to OSHA for regulation in the workplace.

OSHA:

Occupational Safety and Health Administration. An agency of the U. S. Department of Labor responsible for enforcing regulations that protect a worker's health and safety.

PPM:

Abbreviation for parts per million, used to indicate extremely minute concentration of particulates in liquids and gases.

Percentage Volatile by Volume:

The amount of a liquid or solid that can evaporate (become a gas). Substances with a high percentage evaporate quickly and can generate a higher concentration in an enclosed area.

PEL:

Permissible Exposure Limit. The amount of a substance with which you can safely work for a given period of time. The Occupational Safety and Health Administration legally enforce PELs.

Physical Hazards:

Any chemical that is a physical hazard, a combustible liquid, a compressed gas, an explosive, a flammable solid, a liquid or gas, an organic peroxide, is pyrophoric, is reactivity unstable, or is water reactive.

Polymerization:

A chemical reaction in which molecules of a substance form a long chain and give off energy. If this process happens quickly, an explosion may occur.

Pulmonary Edema:

Fluid build-up and swelling in the lungs caused by lung tissue damage.

Reactivity:

A description of the conditions (such as strong sunlight, heat, or flame) that cause a chemical to change or react.

Right-To-Know:

The federal Hazard Communication Standard and similar state laws that provide workers with information on chemicals in the workplace.

Sensitization:

Repeated contact with a substance causing reactions that become increasingly severe, such as an allergic reaction.

STEL:

Short-Term Exposure Limit. The highest concentration of a substance to which you can safely be exposed for a 15-minute period.

Specific Gravity:

The comparison by weight of an amount of a substance to an equal amount of water at a temperature of 39.2 degrees Fahrenheit.

Teratogen:

Any substance that causes damage to an embryo or fetus (in humans, an unborn child) without a substantial effect on the mother.

TLV:

Threshold Limit Value. The highest amount of a substance that you should be able to inhale day after day without affecting your health. Some employees show ill effects below the TLV. TLVs are measured in parts per million (ppm) for gases and vapors and milligrams per cubic meter (mg/m3) for dust, mist, and fumes. Out of six million existing chemicals and chemical mixtures, only about 600 have been assigned TLVs; therefore, you may not find a TLV listed on many MSDSs.

Trade Secret:

The name of a chemical may be missing from an MSDS if that chemical is a legitimate trade secret of the company. A chemical cannot be called a trade secret if a chemist could easily discover its identity. If you need to know the name of a trade secret chemical for serious medical reasons, your employer must provide you or a medical professional with that information.

TWA:

Time Weighted Average. A concentration exposure averaged over an 8-hour workday or a 40-hour workweek.

Vapor Density:

This compares the weight of a vapor or gas to the weight of an equal amount of air. Air is assigned a density of one. A substance with a vapor density higher than one is heavier than air. A substance with a vapor density less than one will rise in air. A vapor or gas with a vapor density greater than one will tend to fall to the bottom of tanks, or will move along the floor when released, like a mercury barometer.

Vapor Pressure:

A measure of how quickly a liquid turns into a gas or evaporates. The higher a liquid's vapor pressure the faster it will turn into a gas. Liquids that turn into gas quickly at room temperature are called volatile. Volatile substances can be easily inhaled and can explode or catch fire easily near heat or flame. Vapor pressure is measured in units of millimeters of mercury.

Water Solubility:

The amount of a substance that will dissolve in water; written as a percent of total.

WEEL:

Workplace Environmental Exposure Limit and Acceptable Exposure Limit. Adopted by the American Industrial Hygiene Association (AIHA) for chemical agents that have no current guidelines established by other organizations.

Section 17A
Silica, Crystalline

Silicosis is a disabling, nonreversible and sometimes fatal lung disease caused by overexposure to respirable crystalline silica. More than one million U.S. workers are exposed to crystalline silica, and each year more than 250 die from silicosis. There is no cure for the disease, but it is 100 percent preventable if employers, workers, and health professionals work together to reduce exposures. The following questions link to resources that provide safety and health information relevant to silica, crystalline.

Silicosis

Focused Inspections: As with focused inspections in construction, those sites targeted for inspection that have implemented an effective and ongoing silicosis prevention program can be exited after the program review. The silicosis prevention program may appear as or be part of the establishment's overall safety and health program. If the facility appears to qualify for a focused inspection based upon management interviews and company documentation the CSHO will verify the program through a brief walkthrough and employee interviews. The CSHO, prior to leaving the facility, shall document that his or her initial review of the site's safety and health program or the site's crystalline silica control program found that the program elements were appropriate and fully effective in providing protection to the affected workers.

The following is a list of elements which may be included in an effective program:

1) ongoing personal air monitoring program*

2) ongoing medical surveillance program

3) training and information to workers on crystalline silica*

4) availability of air and medical surveillance data to workers*

5) an effective respiratory protection program*

6) hygiene facilities and clothing change areas

7) appropriate recordkeeping*

8) personal exposures below the PEL or the facility has an abatement program that also provides for interim worker protection

   8.1 housekeeping program*
   8.2 in construction - a safety and health program*

9) regulated areas

* Required by specific OSHA standards if an overexposure to crystalline silica exists.

Note: In a facility where exposures are below the permissible exposure limit, CSHOs, for education and information purposes, should make the employer aware of elements that should be included in an effective crystalline silica control program in order to provide employees at the establishment protection from possible crystalline silica over exposure(s).

Silicosis Fact Sheet for Construction Workers

NIOSH
National Institute for Occupational Safety and Health
Delivering on the Nation's Promise:
Safety and Health at Work for All People...through Prevention
Important Information for Construction Workers on Deadly but Preventable Dust Exposure

Silicosis has taken a serious toll in the United States, attacking workers in many settings. Here is a real-life story...

A West Virginia driller will not see his 10 year old daughter grow up. He will not be there when she gets married. He will not be there when she starts a family of her own. During the fall of 1988 a driller in his late 40's had chest pain. So he went to a hospital in Morgantown West Virginia. The doctors told him he had silicosis (lung damage). He continued to work and support his family as many workers do. He died from silicosis during the spring of 1994 after 18 years of drilling. After his death his lungs were examined. His lungs were hard because of all the dust in them. It was difficult to cut them even with a scalpel.

Thousands of People are exposed to crystalline silica dust at work every day

Early Deaths From Dust - Don't Let It Happen To You!

1) 42 year old construction worker in Pennsylvania

2) 37 year old construction worker in Ohio

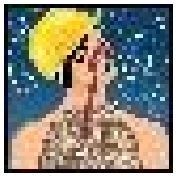
3) 49 year old construction laborer in Oklahoma

4) 41 year old construction worker in Indiana

5) 44 year old construction laborer in North Carolina

6) 39 year old construction painter in Ohio

What Is Silicosis?



Silicosis is lung damage caused by breathing dust containing extremely fine particles of crystalline silica. Crystalline silica is found in materials such as concrete, masonry and rock. When these materials are made into a fine dust and suspended in the air, breathing in these fine particles can produce lung damage.[1] Silicosis can lead to heart failure and increase the risk of other diseases such as TB (tuberculosis). [2, 3, 4]

Symptoms of Silicosis:

1) Initially there may be no symptoms.

2) Latter there may be difficulty in breathing and cough may be present.

3) Infectious complications may cause fever, weight loss, and night sweats.

See a physician if you experience these symptoms and suspect that you are exposed to crystalline silica.

How Do Construction Workers Get Exposed?

Most crystalline silica comes in the form of quartz. Common sand can be as much as 100% quartz. Concrete and masonry products contain quartz in the form of sand. Therefore, there are many ways to be exposed at construction sites.

Some Activities In Which Quartz Dust May Be Present In The Air Include:

1) Abrasive blasting using silica sand as the abrasive.

2) Abrasive blasting of concrete.

3) Chipping, hammering, and drilling rock.

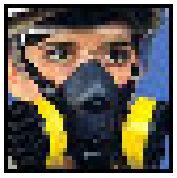
4) Crushing, loading, hauling, and dumping rock.

5) Chipping, hammering, drilling, sawing, and grinding concrete or masonry.

6) Demolition of concrete and masonry structures.

7) Dry sweeping or pressurized air blowing of concrete or sand dust.

How Is Silicosis Prevented?



The key to silicosis prevention is to prevent dust from being in the air. The Occupational Safety and Health Administration (OSHA) requires administrative or engineering controls be used whenever possible. A simple control may work. Example: A water hose to wet dust down at the point of generation. Here are some steps you can take to protect yourself:

1) Always use the dust control system and keep it in good maintenance.

2) When sawing concrete or masonry use saws that provide water to the blade.

3) During rock drilling use water through the drill stem to reduce the amount of dust in the air.

4) Use dust collection systems which are available for many types of dust generating equipment.

5) Use local exhaust ventilation to prevent dust from being released into the air.

6) Minimize exposures to nearby workers by using good work practices.

7) Use abrasives containing less than 1% crystalline silica during abrasive blasting to prevent harmful quartz dust from being released in the air.

8) Measure dust levels in the air.

9) Respirators should only be used after dust controls are in place. Respirators should not be the primary method of protection. If controls cannot keep dust levels below the NIOSH Recommended Exposure Level (REL) then respirators should be used. Select respirators that provide enough protection. Keeping respirators fit for use requires continual maintenance.

When respirators are used OSHA requires employers to establish a comprehensive respiratory protection program. Respiratory protection programs are outlined in the NIOSH Guide to Industrial Respiratory Protection.[5]

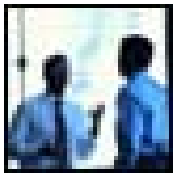
All workers breathing crystalline silica dust should have a medical examination. Medical Examinations:

1) Chest X-ray (classified according to the 1980 International Labour Office (ILO) International Classification of Radiographs of Pneumoconioses[6].

2) Pulmonary function test.

3) Annual evaluation for TB (tuberculosis)(7).

Want More Information?



Two NIOSH Silicosis Alerts available:

1) Preventing Silicosis and Deaths From Sandblasting(8);

2) Preventing Silicosis and Deaths in Rock Drillers.(9)

For free copies call NIOSH at 1-800-35-NIOSH.

Your Comments

The National Institute for Occupational Safety and Health (NIOSH) requests assistance in controlling exposures of construction workers to respirable crystalline silica. The need is urgent to inform construction workers, coworkers, and construction managers about the respiratory hazards associated with respirable crystalline silica.

Your comments on how best to inform construction workers about this preventable disease are welcomed. Please send your comments to: Ken Linch, Industrial Hygienist, NIOSH, Division of Respiratory Disease Studies, 1095 Willowdale Road, Morgantown, West Virginia 26505-2888.

Acknowledgments

The principal contributors to this fact-sheet were Ken Linch, M.S., Dennis Groce M.P.H., John Parker, M.D. and Karl Musgrave D.V.M. of the NIOSH Division of Respiratory Disease Studies, Dorothy Tan, Intern, Association of Schools of Public Health, Cynthia Robinson, Ph.D., and Carol Bumett of the NIOSH Division of Surveillance, Hazard Evaluation, and Field Studies.

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4) Bailey WC, Brown M. Buechner HA. Weill H. Ichinose H. Ziskind M. Silico-mycobacterial disease in sandblasters. Am Rev Respir Dis 110:115-125. 1974.

5) NIOSH Guide to Industrial Respiratory Protection. DHHS (NIOSH) Publication No. 87-116

6) International Labour Office (ILO) Committee on Pneumoconiosis Classification of radiographs of the pneumoconioses Med Radiogr Photogr 57:2-17, 1981.

7) American Thoracic Society (ATS) and Centers for Disease Control (CDC), Treatment of tuberculosis and tuberculosis infection in adults and children Am Rev Respir Dis 134(2):355-363, 1986.

8) National Institute for Occupational Safety and Health NIOSH Alert request for assistance in preventing silicosis and deaths from sandblasting, DHHS (NIOSH) Publication No. 92-102, 1992

9) National Institute for Occupational Safety and Health: NIOSH Alert request for assistance in preventing silicosis and deaths in rock drillers, DHHS (NIOSH) Publication No. 92-107, 1992.

Background: Crystalline Silica and Silicosis

Crystalline silica is a ubiquitous substance which is the basic component of sand, quartz and granite rock.(9) Airborne crystalline silica occurs commonly in both the work and non-work environments. Occupational exposure to crystalline silica dust has long been known to produce silicosis, a pneumoconiosis or dust disease of the lung. Activities such as sandblasting, rock drilling, roof bolting, foundry work, stonecutting, drilling, quarrying, brick/block/concrete cutting, gunite operations, lead-based paint encapsulant applications, and tunneling through the earth's crust can create an airborne silica exposure hazard.

In addition some recently noted exposures to crystalline silica include the following:

1) Calcined diatomaceous earth can contain anywhere from <1% to 75% cristobalite. In addition to use as a filtering media, calcined diatomaceous earth is often used in industries such as food and beverage preparation where only food grade products and equipment can come in contact with foods or beverages being made.

2) Asphalt paving manufacturing may also be a source of crystalline silica exposure, due to the mechanical formation of crystalline silica dust when sand and aggregate passes through rotary dryers. The fine dust can have significant amounts of crystalline silica, depending upon the source of the aggregate. For example, rotary drying of gravel from the Willamette river in Oregon was found to generate dust containing approximately 7 to 12% quartz. The waste dust was transferred periodically by front loader, resulting in clouds of visible dust drifting to the operator.

3) The repair or replacement of linings of rotary kilns found in pulp and paper mills and in other manufacturing locations as well as the linings in cupola furnaces are potential sources of crystalline silica exposure. This work may not be commonly seen due to the infrequency and less visible nature of the work location. Turnarounds and yearly shutdowns are the time when this work commonly occurs.

4) In food processing operations where crops such as potatoes and beans are readied for market, silica overexposures have been documented in the sorting, grading and washing areas.

Geologically, quartz is the second most common mineral in the earth's crust. Quartz is readily found in both sedimentary and igneous rocks. Quartz content can vary greatly among different rock types, for example: granite can contain anywhere from 10 to 40 percent quartz; shales have been found to average approximately 22 percent quartz; and sandstones can average almost 70 percent quartz. Silica is a general term for the compound silicon dioxide (SiO(2)). Silica can be crystalline or amorphous. Different crystalline silica structures exist as polymorphs of silica and include quartz and less common forms such as cristobalite and tridymite. The latter two are less stable than quartz which accounts for the dominance of the quartz form. Quartz can exist as two sub-polymorphs, a-quartz or low quartz, and B-quartz or high quartz. Of these two forms, a-quartz is more common as the B-quartz is apparently only stable at temperatures above approximately 570 degrees centigrade. Upon cooling, B-quartz quickly converts to a-quartz. In the literature, crystalline silica is commonly referred to as silica sand, free-silica, quartz, cristobalite, and tripoli. When diatomaceous earth is subjected to pressure or is processed (calcined) at temperatures above 1000 degrees C some of the amorphous silica is converted to crystalline silica in the form of cristobalite.(11) Recent articles have documented the creation of cristobalite in "after-service" refractive ceramic fiber insulation.(12-14) Amorphous silica has been found to exist in nature as opal flint, siliceous glass, diatomaceous earth and vitreous silica.(15)

Silicosis is one of the world's oldest known occupational diseases with reports dating back to ancient Greece. Since the 1800's, the silicotic health problems associated with crystalline silica dust exposure have been referred to under a variety of common names including: consumption, ganister disease, grinders' asthma, grinders' dust consumption, grinders' rot, grit consumption, masons' disease, miner's asthma, miner's phthisis, potters' rot, sewer disease, stonemason's disease, chalicosis, and shistosis. Silicosis was considered the most serious occupational hazard during the 1930's, and was the focus of major federal, state, and professional attention during this time.(10) The hazard is still present 60+ years later.

Crystalline silica is commonly found and used in the following industries:

1) Electronics industry
2) Foundry industries
3) Ceramics, clay and pottery, stone, and glass industries
4) Construction
5) Agriculture
6) Maritime
7) Railroad industry (setting and laying track)
8) Slate and flint quarrying and flint crushing
9) Use and manufacture of abrasives
10) Manufacture of soaps and detergents
11) Mining industries

Perhaps the most familiar use of quartz sand is as an abrasive blasting agent to remove surface coatings prior to repainting or treating. A recent alert published by the National Institute for Occupational Safety and Health (NIOSH) estimates that there are more than one million American workers that are at risk of developing silicosis. Of these workers, NIOSH further estimates that more than 100,000 are employed as sandblasters.(16)

In the United States, from 1968 through 1990 the total number of deaths where silicosis was reported anywhere on the death certificate was 13,744. Of these, approximately 6,322 listed silicosis as the underlying cause of the death.(17) In this study, deaths in the United States due to silicosis was primarily concentrated in 12 states (California, Colorado, Florida, Illinois, Michigan, New Jersey, New York, Ohio, Pennsylvania, Virginia, West Virginia, and Wisconsin.) The silica-related deaths in these 12 states accounted for 68% of the total silica related deaths in the United States. By industry, construction accounted for 10% of the total silicosis-related deaths.(17)

Based upon the wide spread occurrence and use of crystalline silica across the major industrial groups (maritime, agriculture, construction, and general industry), and in consideration of the number of silicosis related deaths, the NIOSH estimates for the number of exposed workers, and the health effects of crystalline silica dust exposure (e.g., pulmonary fibrosis, lung and stomach cancer), the Agency is implementing a nationwide special emphasis program to assure worker protection from over exposure to crystalline silica dust.

Health Effects of Silica Exposure

Inhalation of crystalline silica-containing dusts has been associated with silicosis, chronic obstructive pulmonary disease, bronchitis, collagen vascular diseases, chronic granulomatous infections such as tuberculosis, and lung cancer. In general, aerosols of particulates can be deposited in the lungs. This can produce rapid or slow local tissue damage, eventual disease or physical plugging. Dust containing crystalline silica can cause formation of fibrosis (scar tissue) in the lungs.(9)

The inhalation of free crystalline silicon dioxide (SiO(2)) can produce a fibrotic lung disease known as silicosis. Particle size, dust concentration and duration of dust exposure are important factors in determining the attack rate, latency period, incidence, rate of progression and outcome of disease. A higher attack rate and severity of silicosis is seen with heating crystalline silica-containing materials to greater than 800 degrees C to transform SiO(2) into tridymite and cristobalite (both of which occur naturally and are also found in synthetic silica preparations). High cristobalite concentration also result from direct conversion of diatomaceous earth following heat and/or pressure and can be found in the superficial layers of refractory brick which have been repeatedly subjected to contact with molten metal.(9)

NIOSH has classified three types of silicosis, these include acute, accelerated, and chronic.

1) **Acute Health Effects:** Intense crystalline silica exposure has resulted in outbreaks of acute silicosis referred to medically as silico-proteinosis or alveolar lipoproteinosis-like silicosis. Initially, crystalline silica particles produce an alveolitis (inflammation in the gas exchange area of the lung) which is characterized by sustained increases in the total number of alveolar cells, including macrophages, lymphocytes and neutrophils. The alveolitis has been found to progress to the characteristic nodular fibrosis of simple silicosis.

A rapid increase in the rate of synthesis and deposition of lung collagen has also been seen with the inhalation of crystalline silica particles. The collagen formed is unique to silicainduced luna disease and biochemically different from normal lung collagen.(18)

2) **Accelerated Health Effects:** Accelerated silicosis may occur with more intense exposure over 5 to 15 years. Fibrotic nodules are generally smaller and the massive fibrosis often occurs in the mid-zones in the lungs.

   Acute and accelerated silicosis have been associated with abrasive blasters.

3) **Chronic Health Effects:** Chronic silicosis usually takes 20 to 45 years to develop as a result of prolonged exposure to free crystalline silica. Nodular lesions tend to form in the upper lobes. In the simple stage of silicosis, symptoms and impairment of pulmonary function are uncommon. If progressive massive fibrosis (PMF) forms from the coalescence of fibrotic nodules the disease usually progresses, even following removal from exposure. Symptoms of silicosis may not develop for many years. Shortness of breath with exertion is the most common symptom of established silicosis. Cough and expectoration may develop with disease progression, especially in cigarette smokers. Wheezing typically only occurs when conditions such as chronic obstructive bronchitis or asthma are also present. Significant abnormality on a chest x-ray may not be seen until 15 to 20 years of exposure have occurred.

   When advanced disease and progressive massive fibrosis are present there is distortion of the normal architecture of the lung. Airway obstruction may occur from contraction of the upper lobes of the lung. Emphysematous changes may develop in the lower lobes of the lung.(19)

   Cancer: The issue of crystalline silica exposure and cancer is a complicated one with disagreement in the literature.(20) In worst case, exposure to respirable crystalline silica dust has been associated with lung cancer.(20-26) There also has been the suggestion of stomach cancer associated with ingestion of crystalline silica.(7) The International Agency for Research on crystalline line silica and Cancer (IARC) in examining the carcinogenesis of silica has published monographs regarding crystalline some silicates. IARC determined that there is sufficient evidence for carcinogenicity in experimental animals with limited evidence for carcinogenicity in humans and has classified silica as a 2B carcinogen.(21) IARC is in the prcess of revisiting the crystalline silica carcinogen issue based upon recent epidemiological studies.

Studies have demonstrated a statistically significant, doserelated increase in lung cancer in several occupationally exposed groups. Winter (1990) observed that the lung cancer risk for pottery workers increased with estimated cumulative exposure to low levels of silica found in potteries. Another study also found that the risk of lung cancer among pottery workers was related to exposure to silica, although the dose-response gradient was not significant (McLaughlin, et al., 1992). An adjustment for possibly confounding exposure to polycyclic aromatic hydrocarbons slightly raised the odds ratios for exposure to silica. This study also analyzed lung cancer risk in tin miners in China and found a significant trend of increasing risk of lung cancer with increasing cumulative respirable silica exposure. A significant dose-response relationship between death from lung cancer and silica dust particle-years has also been demonstrated for South African gold miners (Hnizdo and Sluis-Cremer, 1991). In this study a synergistic effect on lung cancer risk was found for silica exposure and smoking. Lung cancer risk among workers in the diatomaceous earth industry has been studied by Checkoway, et al. (1993). Results showed increasing risk gradients for lung cancer with cumulative exposure to crystalline silica. The authors felt that this finding indicated a causal relation. Several studies have demonstrated a relationship between the degree of silicosis disability and risk for lung cancer (Goldsmith, 1994). Since severity of silicosis reflects silica exposure, this may also indicate a dose-response relationship for silica exposure and lung cancer (Checkoway, 1993).

For additional information please refer to references No. 22-26.

Note: Due to the potential association between exposure to dust containing crystalline silica and the development of lung and stomach cancer, one may find facilities where the employer is evaluating or has evaluated this exposure using thoracic samplers. Thoracic dust is defined as that portion of inhaled dust that penetrates the larynx and is available for deposition within the airways of the thorax. Thoracic dust includes the respirable fraction. The collection of thoracic dust samples currently is not a method used by the Agency. Area Offices need to be aware that thoracic sampling devices are currently available and one may run across the use of these samplers during inspections, For more information one can consult with the OSHA Salt Lake Technical Center (SLTC) or the Office of Health Compliance Assistance.

The following list of standards includes those standards, that may, under appropriate inspection conditions be cited for crystalline silica overexposure under this SEP. The standards listed below are for general industry, maritime, and construction standards.

OSHA Requirement	Gen. Ind. Std.	Const. Std.	Maritime Std.
Respiratory protection	1910.134	1926.103	1915.152
Permissible exposure limit and controls	1910.1000	1926.55 & .57	1915.1000
Accident prevention & warning signs	1910.145	1926.200	--
Access to employee exposure and medical records	1910.20	1926.33	1915.1120
OSHA 200 forms	1904	1904,1926.22	1904
Abrasive blasting, breathing air, enclosures, controls	1910.94	1926.28, 55, 95, 100, 101,102, 103, and 300	915.131, 133 151, 152, 153, and 1000
Hygiene	1910.141	1926.27 and 51	1915.97
General PPE	1910.132	1926.28, 95, 100-105	1915.151-154
Hazard Communication	1910.1200	1926.59	1915.1200
Safety and Health program	--	1926.20	--
General training	--	1926.21	--

Section 18
Respiratory Protection Program

Introduction

This program is designed to help reduce employee exposure to occupational air contaminants such as: dust, fumes, mists, gasses, vapors, microorganisms, and radionuclides. Where feasible, exposure to contaminants will be eliminated by either engineering controls (i.e., general and local exhaust ventilation, enclosure, or isolation), or substitution of a less hazardous process or material. When effective engineering controls or substitution are not feasible, use of personal protective respiratory equipment may be required. The purpose of this program is to determine the following information:

1) When respiratory protection is needed

2) Which respirators are needed

3) Which employees are required to wear respiratory protection

4) How respirators are used in a correct and safe manner.

5) This program shall be administered pursuant to the requirements of the OSHA Respiratory Protection Standard, 29CFR 1910.134 (Revised April 8, 1998) attached to this document.

Responsibilities

Management*:*

Doster Construction Company is committed to maintaining a healthful and safe work environment. Doster Construction Company is responsible for establishing this respiratory protection program to assist in reducing or eliminating workplace exposure to hazardous materials.

The Corporate Safety Department:

The Corporate Safety Department is responsible for the management of this program. Specific employees in the Department have responsibilities as follows:

1) Safety Director, Corporate Safety Department, Program Adminstrator

The Project Safety Managers and contract Industrial:

1) Coordination and monitoring of the program.

2) Evaluation of the need for respirators including surveillance of conditions and degrees of potential exposure.

3) Modification of the program as appropriate.

4) Identification of employees for participation in the program.

5) Establishment/maintenance of medical surveillance.

6) Coordination of respirator fit testing.

7) Selection of NIOSH-approved respirators and maintenance of respirator inventory.

8) Training sessions for participants regarding use, care, and storage of respirators.

9) Communication of changes in regulatory standards and/or the Doster Construction Company Respiratory Protection Program to supervisors and employees.

10) Maintenance of records for this program.

Field Superintendents:

1) Insure that all employees are knowledgeable of the respiratory protection requirements for the areas in which they work.

2) Monitor the proper use and care of respirators.

3) Implement a cleaning and inspection program for respiratory equipment, including designation of proper storage areas for respiratory equipment.

4) Enforce employee compliance with the Respiratory Protection Program.

5) Monitor employee compliance with this program. This includes assurance that:

   5.1. Employees who are required to wear a respirator because of potential exposure, do so, as a condition of employment.
   5.2. Employees participate fully in all aspects of the program including medical surveillance and fit testing before wearing a respirator.
   5.3. Employees follow instructions for use, care, storage, and maintenance as outlined by this program.

Employees:

1) Be aware of respiratory protection requirements for their work area.

2) Follow all aspects of this plan including completion of training, medical surveillance, and fit test requirements, prior to using a respirator.

3) The Field Superintendents have the responsibility to order only those respirators approved by the program.

The Medical Exam contractor:

1) Evaluate physical ability of employees to wear a respirator.

2) Communicate written results to the Doster Construction Company Safety Department, as appropriate.

3) Fit-Testing contractor is charged with the fit testing of all participants in the Respiratory Protection Program.

Selection of Respiratory Protective Equipment:

Evaluation of Potential Hazards:

1) Operations and processes will be monitored for potential respiratory hazards, according to accepted industrial hygiene practices.

2) Personal sampling equipment may be used in accordance with accepted industrial hygiene standards to sample an area. Decisions regarding the use of respiratory protection may be based upon these results or by a reasonable and conservative estimate of these hazards.

3) Respirator use is mandatory in areas considered hazardous and will comply with 29 CFR 1910.134 or 1926.110.

4) Voluntary use of respirators is not permitted in areas that are considered non-hazardous.

5) Respirators are not to be confused with dust masks

Types of respirators:

1) Air-purifying respirators clean the contaminated atmosphere through the use of filters, absorbents, or chemicals. Air-purifying respirators can only be used where there is sufficient oxygen to sustain life and the air contaminant level is within specified limitations of the respirator.

2) Mechanical-filter, air-purifying respirators provide protection against airborne particulate matter including: dusts, mists, metal fumes, smokes, and microorganisms, but do not provide protection against gases, vapors, or oxygen deficiency.

3) Chemical-cartridge air-purifying respirators provide protection against certain gases and vapors by using various chemical filters to purify the inhaled air.

4) The Occupational Safety and Health Administration (OSHA) requires that NIOSH approved air-purifying respirators be used by workers.

Atmosphere or air-supplying respirators provide breathable air from a source of air which is independent from the ambient atmosphere.

There are three classes of atmosphere-supplying respirators:

1) Supplied-air respirators

2) Self-contained breathing apparatuses (SCBA)

3) Combination-SCBA and supplied-air respirators. The use of SCBA equipment may be required in specific areas for emergency use. Only appropriately trained employees may use SCBA at Doster Construction Company.

Combination air-purifying and atmosphere-supplying devices have an auxiliary air-purifying attachment, which provides protection in the event the air supply fails.

WORKERS USING RESPIRATORS MUST BE SPECIFICALLY TRAINED FOR THE RESPIRATOR THEY ARE PLANNING TO USE.

Respirators currently approved by the Doster Construction Company Safety Department are:

1) Half-face respirator - (3M 7000)

2) Full-face respirator - (3M 6000)

3) PAPR respirator - (3M/MASHA)

4) N95 respirator for TB (Tecnol)

The following cartridges are available at the Safety Department. Listed are their colors and usage:

1) Purple (Magenta) - Particulates (dust, mist, fumes, asbestos, and radionuclides)

2) White - Acid gas

3) Black - Organic vapor

4) White with 1/2" green strip – HCl

5) Yellow - Acid gases and organic vapor

6) Green - Ammonia

7) Blue - Carbon monoxide

8) Colors vary (N95) - T.B. Exposure

Doster Construction Company shall ensure that all filters, cartridges, and canisters used in the workplace are labeled and color-coded with the NIOSH approval label and that the label is intact and legible.

Selection of Respirators:

1) Wherever respiratory protection is required, NIOSH-approved respirators, appropriate to the hazards, shall be selected by the Corporate Safety Department.

2) Selection is based upon physical and chemical properties of air contaminants and concentration levels likely to be encountered by employees.

3) Respirators will be made immediately available to each new hire or transferee to a job where respiratory protection is required.

4) Respirators shall be selected in compliance with all relevant regulatory requirements (29CFR 1910.134 and 29CFR 1926.1101).

Areas where respirators may be required:

1) Respiratory protection shall be required in any work area that has the potential to create an environment where the atmospheric contamination levels exceed the OSHA permissible exposure limits (PELs) for the specific contaminant.

2) Respiratory protection is always required to be worn in accordance with 29CFR 1926.1101 in any area where workers' tasks may disturb known or potential asbestos-containing material.

3) Self-contained breathing apparatuses may be required to be worn when filtered respirators are not adequate. These may include areas with insufficient oxygen, where contaminants are at a level Immediately Dangerous to Life or Health (IDLH), or the contaminant levels are unknown.

Medical Evaluation:

For N95 Respirator users.

Prior to the issuance of a respirator all employees shall complete a medical questionnaire. (See 29 CFR 1910.134 Appendix C.) This questionnaire must be approved by a Physician or Licensed Health Care Professional (PLHCP) before issuance of an N95 respirator.

Medical examinations will be given to any employee at the discretion of the PLHCP.
For Half-Face, Full-Face, PAPR, and SCBA Respirator users

Prior to the issuance of a respirator all employees shall complete a medical questionnaire, (See 29 CFR 1910.134 Appendix C.), and receive a medical exam to determine the employee's physical ability to wear a respirator. This exam shall be provided without cost to each eligible employee.

Content of Medical Evaluations:

1) A complete occupational and medical history update

2) A complete physical

3) Pulmonary function testing to include Forced Expiratory Volume at one second (FEVI), Forced Vital Capacity (FVC) and the FEVI -to- FVC ratio.

4) Chest X-ray and GI evaluation for asbestos workers at the discretion of the (PLHCP).

5) Any other test deemed medically appropriate by the examining PLHCP.

Fit Testing:

The proper fit of respiratory equipment to the user is determined by a qualitative fit test procedure according to 29 CFR 1910.134 Appendix A.

Employees who take part in this program are not permitted to wear beards unless they provide:

1) A documented religious reason

2) A documented medical condition

Employees must provide the Corporate Safety Department with a written personal statement for a religious exemption and a written physician's statement for a medical exemption. Respiratory protection for these employees will be evaluated on a case-by-case basis.

Fit testing shall be performed according to the following schedule:

1) Prior to issuance of a respirator, but after medical clearance.

2) Annually for both Asbestos and Non-Asbestos workers.

3) If any of the following conditions occur:

    3.1. Significant weight gain or loss
    3.2. Dental changes
    3.3. Facial scarring
    3.4. Cosmetic surgery

Employees are responsible to check their respirators for fit prior to each use by performing negative and positive seal checks as described in 29 CFR 1910.134 Appendix B-1. If these checks are not successful, the respirator should not be used.

Respiratory Use:

Employees must pass both the medical examination and the fit test in order to wear a respirator. Employees may not wear a respirator if they have facial hair which comes between the sealing surface of the facepiece and the face or any condition which interferes with the face to facepiece seal or valve function.

Employees who wear respirators are permitted to leave the regulated area to wash their faces and respirator facepieces as necessary. This may be done to prevent skin irritation associated with respirator use or to change the filter elements if a change in breathing resistance or chemical vapor breakthrough is detected.

Every employee is required to perform a negative and positive seal check prior to respirator use.

Maintenance of Respiratory Protective Equipment:

All respirators shall be maintained using the procedures in 29 CFR 1910.134 Appendix B-2 or procedures recommended by the manufacturer, provided that such procedures are of equivalent effectiveness. The following methods shall be used to maintain the equipment:

Cleaning/Disinfecting

Respiratory equipment shall be washed thoroughly in warm water with detergent, using a soft brush. Detergents with a bactericide are preferable. If detergent with a bactericide is not used, the detergent wash shall be followed with a disinfecting rinse. Components shall be hand-dried with a clean lint free cloth or air dried before assembly.

Storage

Dry, clean, disinfected respirators shall be sealed in clean plastic bags out of direct sunlight with the facepiece and exhalation valve in a non-distorted position.

Repair

Repair and replacement of damaged parts must be done before the respirator can be used. Replacement parts must be those of the manufacturer of the equipment. Replacement parts are

available from the Corporate Safety Department. Repairs or replacement must be performed by a qualified individual.

Inspection Procedures

All respirators shall be inspected by each user before and after each use and during cleaning. The following items will be examined during inspection:

1) Rubber Facepiece

    1.1. Cracked or broken air-purifying element holder(s), badly worn threads or missing gasket(s)

        a. Excessive dirt
        b. Cracks, tears, or holes
        c. Distortion
        d. Cracked, scratched, or loose-fitting lens (full face)

    1.6. Incorrectly mounted full facepiece lens or broken/missing mounting clips

2) Head Strap

    2.1. Breaks or tears
    2.2. Loss of elasticity
    2.3. Broken or malfunctioning buckles/attachments
    2.4. Excessively worn serrations on head piece
    2.5. Harness which might allow the facepiece to slip

3) Inhalation/Exhalation valves

    3.1. Detergent residue, dust particles, dirt, or hair on valve or valve seat.
    3.2. Cracks, tears, distortion in valve material or valve seat
    3.3. Improper insertion of the valve body in the facepiece
    3.4. Cracks, breaks, or chips in the valve body particularly in the sealing surface
    3.5. Improper installation of the valve in the valve body

4) Filter elements
    - 4.1. Incorrect cartridge, canister, or filter for the hazard
    - 4.2. Missing or worn gaskets
    - 4.3. Worn threads
    - 4.4. Cracks or dents in filter housing
    - 4.5. Incorrect installation, loose connections, or cross-threading in holder
    - 4.6. Evidence of prior use of sorbent, cartridge, or canister, indicated by absence of sealing material, tape foil, etc. over inlet

Training:

All employees in the program will be trained annually in the proper use and care of their respiratory equipment that have been assigned to them.

Training will include the following elements:

1) Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator

2) What the limitations and capabilities are for the respirator

3) How to use the respirator effectively in routine and emergency situations, including situations in which the respirator malfunctions

4) How to inspect, doff and don, use, and check the seals of the respirator

5) What the procedures are for maintenance and storage of the respirator

6) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.

The training shall be conducted in a manner that is understandable to the employee.
The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.

Program Evaluation:

Surveillance of the workplace will be conducted by the Corporate Safety Department on an ongoing basis to determine the necessity of respiratory protection.

This program will be reviewed and updated periodically via:

1) Review of training rosters

2) Review of medical evaluation records

3) Review of fit testing rosters

4) Observation of compliance with care, use, and storage

5) Enforcement of the program

6) Review and observation of the appropriateness and competence of the fit testing program.

Record Keeping:

1) Records will be maintained at the Corporate Safety Department and will include the following:

    1.1 Medical Evaluations
    1.2 Fit Testing
    1.3 A written copy of The Doster Construction Company Respiratory Protection Program
    1.4 A copy of the OSHA Standard 29 CFR 1910.134

All written materials are available at the Doster Construction Company Safety Department upon request.

Contact Numbers:

Corporate Safety can be contacted at (205) 443-3800 for questions or clarifications regarding this Respiratory Protection Program.

For more information see: 29 CFR 1910.134

Section 19
Hearing Conservation

Even though we cannot see sound, it is a force with real dimensions and definite properties: intensity and duration. Intensity is the loudness of a sound, or the pressure it exerts through the ear. It is measured in units called decibels (dB). In assessing noise, a special measure called "dBA" indicates damage to hearing. Examples of the dBA rating for many common exposures are provided in the first table. The higher the dBA number, the greater the risk of damage to hearing.

140	threshold of pain: gunshot, siren at 100 feet
135	jet take off, amplified music
120	chain saw, jack hammer, snowmobile
100	subway (not the sandwich shop)
90	OSHA limit - hearing damage if excessive exposure to noise levels above 90 dB
85	inside acoustically insulated tractor cab
75	average radio, vacuum cleaner
60	normal conversation
45	rustling leaves, soft music
30	whisper, empty theater, watch ticking
15	average threshold of hearing
0	acute threshold of hearing - weakest sound

Duration is the amount of time you are exposed to a sound level. In the second table, the right-hand column lists various high sound levels and the left-hand column indicates the length of exposure that is safe for the corresponding noise level during a day. These figures have been determined after years of research on noise-induced hearing loss and are accepted as the standard for allowable noise level exposures.

Permissible Noise Exposure Scale
(*Based on OSHA Noise Standard)*

Duration (hours per day)	Sound level (dBA)
8	90
4	95
2	100
1	105
1/2	110
1/4 or less	115

The ears provide two warning signs for over-exposure to noise: temporary threshold shift (TTS) and ringing in the ears (tinnitus). After leaving a noisy area or piece of equipment, many people commonly experience both of these symptoms. The temporary hearing loss is difficult to detect unless a hearing test is performed.

This temporary hearing loss was taken into consideration in the exposure limits listed in the second table. For example, should you be exposed to a noise level of 100 dBA for two hours, the remaining 22 hours of that day's exposure should be at a noise level below 90 dBA. This allows the ear to recover from the temporary hearing loss. This recovery period varies, depending upon the individual, the severity and length of exposure.

Hearing usually returns almost completely in 12 to 14 hours if there is no more noise exposure. Any amount of hearing that does not return becomes a permanent threshold shift (PTS) or permanent hearing loss. With repeated exposure, the effects are cumulative. It is the need to prevent this cumulative damage that drives hearing protection programs, including the one here at Doster Construction Company. If you suspect that you are being exposed to excessive levels of noise, contact your Project Safety Manager. We can arrange for 8-hour time-weighted monitoring as well as spot measurement of noise levels to determine what level of protection is appropriate to protect your hearing.

Section 20
Housekeeping

This procedure is designed to give Supervisors and employees guidance in maintaining a neat work area which should encourage safe work habits. Each contractor will be responsible for cleaning up their work area. No job is complete until the area has been cleaned up.

Orderliness

1) Keep tools and working materials in proper containers.

2) Store trash, waste, and scrap in proper containers.

3) Store materials safely.

4) Put cigarette stubs in butt cans.

5) Keep small items in boxes or bins.

6) Keep the floor clear of tools, rod ends, and metal shavings.

7) Keep walkways clear.

8) Ensure that work tables are occupied only by work at hand and the tools required for the work being done.

9) Do not leave aerosol cans out when not in use.

10) Store or contain material so that fire has no place to start.

11) Clean up tools and work areas as your job progresses.

12) Keep cords and hoses 7 feet overhead or lay them flat out of walkways.

13) Keep all material, tools and equipment in a stable position (tied, stacked or choked) to prevent rolling or falling.

14) Maintain clear access to all work areas.

15) Keep stairways clear of debris.

16) Clean up liquid spills right away.

Access

1) Walkways and stairways must be clear, ladders must not be blocked, and emergency exits must not be blocked, and emergency exits must be identified and clear.

2) Do not block any emergency equipment or electric disconnect switch/box.

3) Stack, store, or spot material so that it can be reached readily by workers and material-handling equipment.

NOTE - In general, all trash, waste, and scrap must be placed in properly placed trash cans and routes leading to and from all work locations must be free and clear of obstructions and well lighted.

Section 21
Mold and Water Intrusion Control Program

Introduction

"Fungi" refer to a diverse group of organisms that in the biological classification scheme have their own kingdom, separate from plants and animals. Fungi do not ingest their food but absorb nutrients by decomposing dead organic matter, a trait that allows them to grow in many indoor and most outdoor environments. The term "fungi" is used to refer to most forms of microbial contamination commonly found in buildings. "Mold" is a term commonly used to describe visible fungal growth, just as "mildew" is a general term commonly used to refer to fungi growing on fabrics, window sills or bathroom tile.

Most contaminated building problems originate from outdoor fungi that grow in the soil, plant litter, etc. Typically, fungal levels are higher outside than inside buildings. Outdoor fungi concentrations vary according to geographical location, climate conditions, season, and surrounding human activity. These organisms reach the indoor environments with outdoor air, or are transported inside by people or by building materials brought inside.

The growth of fungi or mold inside buildings depends on a number of interrelated variables, but moisture is recognized as the primary factor controlling biological growth. Second to moisture is temperature and available nutrients. These latter two are not limiting factors, because any building that's suitable for humans already has suitable temperature and nutrients for growth. Thus, the control of moisture in buildings becomes the critical variable that will prevent or limit microbial growth and is the primary focus of prevention and control.

Fungal growth is encouraged by wet, warm, and humid conditions. When ideal conditions are present (wet building material, humidity above 60%, temperature between 68 to 90- degrees Fahrenheit and little to no air movement) germination and growth can quickly occur within 24 to 48 hours. Therefore, in periods of heavy rain or flooding, fungal growth can be very rapid.

Risks

Mold growth is often the result of water-damaged building materials, such as wet carpet, wall covering, wallboard, etc. These building materials may be damaged because of roof or wall leaks, clogged air conditioner condensate drain lines, chronic plumbing leaks, condensation at windows or within wall cavities, wet ductwork surfaces, and improperly controlled humidification systems. The water damaged material offers nutrients for growth and should be dried and treated as soon as possible. Once heavily contaminated, it is difficult to successfully decontaminate porous, water-damaged building materials. Repairing the defects that lead to water accumulation and remediation efforts described below are both needed to control growth.

Serious potential health effects have been linked to certain types of fungal cell products called "mycotoxins." The best-known mycotoxin is aflatoxin, a potent toxin found in airborne dust from handling contaminated corn and peanuts during feed processing.
One of the keys to success is the continued communication and collaboration between the building owner, construction contractors and design engineers in regards to mold and water intrusion. This communication needs to be established from the inception of the project and throughout all the construction phases; with proper preplanning, guidelines will be establish to minimize the exposure of the project to both exterior and interior elements that cause contamination and subsequent remediation.

Employee Responsibilities

This program will outline basic company responsibilities in case an event is identified.

I. Jobsite Superintendent

Jobsite superintendents are responsible for performing routine visual inspections on all construction material, whether it is installed, stored or being delivered to the job. Visual inspections shall be performed with the guidance of the Water Intrusion Control Construction Checklist. Any evidence of moisture shall be documented on the form and photographs shall be taken for the files. After an assessment is made of what level of contamination is identified the superintendent shall inform jobsite Project Manager and Corporate Safety Director or Insurance Coordinator at the home office. Depending on the level of contamination job superintendent will continue to remediate the area(s) (contamination of less than 30 ft^2) or contact a third party authorized remediation company (any contamination in excess of 30 ft^2) for proper control and remediation.

Perform a visual inspection, document and photograph all materials or areas of the jobsites that were remediated and controlled. Copy and send post-remediation inspection checklist and photographs to the Insurance Coordinator or Corporate Safety Director.

All environmental, surface or air sampling, if required, shall be performed by an authorized third party remediation company.

II. Project Manager

Project Managers are responsible for ensuring all documentation of visual inspections, pre and post remediation, are properly filed and archived. Additionally, assist job superintendents in the process of documenting and photographing any evidence of moisture in materials that are found on the jobsite. Coordinate with superintendents the remediation process to be implemented and assist in contacting appropriate parties within the company.

III. Corporate Safety Director or Insurance Manager

Safety Director and/or Insurance Coordinator responsibilities include the assessment of this programs' implementation in the field, routinely verify the compliance with requirements outlined in this document, and assist field project team in the safe implementation of any remediation processes to be performed on the jobsite. Coordinate with field project team and third party remediation companies the proper procedure to be implemented in case of significant moisture evidence and processes to be used to eliminate and secure the affected areas. Additionally, ensure that proper documentation is in the corporate files in the case that a remediation process is in effect.

Water and Moisture Assessments

The appearance of mold, water damage, or musty odors should be addressed immediately. All sources of water should be stopped and the nature and extent of water damage should be determined. Dry and repair all water damaged materials. Mold-damaged materials should be remediated as discussed below. An effective environment assessment starts with a visual inspection of the building components. In the majority of situations, a visual inspection is the most important step to take to prevent future problems.

I. Visual Inspection

A visual inspection of physical structure including walls, floors, ceiling tiles, carpets, furnishings, material storage, spaces in ventilation ductwork, fan coil units, drain pans, air filters, supply air distribution, humidifiers, sump pumps, and wall cavities is the first step in an assessment process. Investigators look to identify potential sources of biological agents, for evidence of current or past water damage or excess moisture and as needed, form plans for either more in-depth investigations or control and remediation of noted problems.

A moisture meter, can be used to detect building material moisture levels, and is helpful in detecting hidden sources of moisture as well as the extent of past water damage.

Checklist: Water Intrusion Control Construction Checklist
Reference Guide: Table A. Potential Sources of Biological Agents in Buildings

II. Environmental Sampling
To be performed by an authorized third party remediation company

Environmental samples are primarily collected to test suspected sources, identify the agents present, or demonstrate that a pathway exists from the suspected source to people in the building.

Used properly, environmental sampling can be a useful investigative tool if the contamination source or the exposure pathway to a building occupant is not obvious.

III. Surface Sampling
To be performed by an authorized third party remediation company

Surface sampling includes taking portions of wallboard, pieces of duct lining, carpet segments, adhesive-tape lifts, etc. which are tested for the primary purpose of identifying the sources and identity of biological agents that should be remediated. These samples should be taken from the visibly moldy areas and an equal number taken away from the visible contamination. Furthermore, these samples will provide objective data on the extent of contamination or need for remediation beyond that which is visible.

A trained and experienced individual should conduct the sampling. Bulk samples are normally collected by scraping or cutting material from a moldy surface with a clean tool into a clean plastic bag. Surface samples are collected by wiping the contaminated area with a sterile swab or by stripping the contaminated area with clear tape. A laboratory accredited by the American Industrial Hygiene Association, Environmental Microbiology Laboratory Accreditation Program- EMLAP, should be used to analyze the samples. Corrective action is suggested for microbial growth found on materials that are in direct contact with indoor air or subject to disturbances that might release biological particles into building areas.

IV. Air Monitoring
To be performed by an authorized third party remediation company

Air monitoring results can be useful if the presence of mold is suspected in hidden wall cavities or air handling ductwork but cannot be identified by a visual inspection or bulk sampling. Air sampling can also useful if there is evidence from a visual inspection or bulk sampling that there may be contamination and the inspector is trying to determine if there is an airborne pathway by which people can be exposed.

Although air samples can provide information about a site as it existed during the time tested, the results may not represent conditions at a time in the past or future. Therefore, air samples should only be conducted after the formation of a hypotheses about potential sources of biological agents and the pathway by which people may be exposed to these sources.

Only individuals trained in air sampling methodology should conduct the sampling. A laboratory accredited by the American Industrial Hygiene Association, Environmental Microbiology Laboratory Accreditation Program- EMLAP, should be used to analyze the samples.

Prevention and Controlling Strategies

The general principles for preventing microbial growth in buildings can be summarized by:

a. Protecting building materials from moisture before and after installation.
b. During construction, clean accumulation of particulates before closing mechanical spaces and wall cavities.
c. Preventing microbial colonization of building materials, the HVAC system and interior space through the control of moisture in the building.
d. Limit the intrusion of spores, aerosols, or animals from outdoor sources.
e. Limit indoor accumulation of dust, dirt, and aerosols from human and animal sources.

I. Strategies for Control of Mold Growth during Construction Operations

A. Building Product Installation

a. Install materials & equipment per the manufacturer's instructions to install, maintain, and clean to avoid mold development. Use care when installing roofs and windows and make sure they are properly flashed.
b. Deliver materials to site just in time for installation. Reduce on-site storage as much as possible.
c. If stored on site, use pallets or dunnage to prevent contact with the ground or concrete surfaces.
d. Leave a small air gap between concrete surfaces and porous materials.
e. Inspect materials for water damage and mold growth before installation. Do not install damaged materials.
f. Clean wall cavities and other enclosed areas of dirt and debris before closing. Dirt will also contain mold spores.
g. Mechanically ventilate damp areas when natural ventilation is not enough.
h. Install porous materials only after building is weather tight. When it is necessary to expedite the schedule, take steps to protect all porous materials installed.
i. Construct flashing details at joints and penetrations according to the plans and specifications. Double check installation. Leaks from flashing problems may not show up for months and are much more expensive to repair after the building is complete.

B. Moisture Control

Some of the common means of moisture entry into buildings are water intrusion, leakage, vapor migration, capillary movement, air infiltration, and bypassing dehumidification cooling coils.

a. During construction, test and certify water supply and fire protection systems with air before activating.
b. Test and certify waste and vent systems for leakage before closing in wall cavities.
c. If water damage is within 24-48 hours, dry materials to a moisture level that won't support microbial growth.
d. In cases when more than 48 hours have passed since water got into the building, make efforts to dry out the building. Not all molds form quickly and removing water eliminates a key factor in mold growth.
e. Discard sewage-contaminated porous material.
f. Prevent future floods and other water intrusion.
g. Reduce the potential for moisture accumulation and condensation with humidity control and insulation.
h. Avoid impermeable wall coverings. Use permeable paints and coverings on interior walls, operate the HVAC system at a slight positive pressure with respect to outdoors and avoid excessive cooling.
i. Make the building weather tight before installing finish materials.
j. Provide an effective drainage plane for the egress of water that may accidentally enter the building.
k. Backfill the foundation as soon as it is deemed practical.
l. Grade the site to divert surface water away from the building.
m. Prevent surface water penetration
n. Failure to caulk joints and other construction details, especially around windows, can lead to water leaks into wall cavities. Water wicking into the basement through walls and floors accounts for a high prevalence of moldy basements.
o. One of the largest sources of mold is due to condensation on the building envelope. Ventilate the building to reduce moisture levels to below those that allow condensation to occur.
p. Dehumidify indoor air by operating the cooling coils in an HVAC system to remove moisture from outdoor or return air.
q. Provide positive air pressure inside buildings in high humidity climates. If buildings are negative to outside pressure, moist air is pulled into the wall cavity leading to condensation regardless of whether the wall is built correctly or not.
r. In HVAC Systems, install and maintain air filters of the highest grade compatible with the system. Never run the system without filters in place.
s. Protect air filters from wetting and replace them periodically.
t. Avoid the use of porous materials inside the ductwork
u. Physically remove growth in drain pans and keep pans and cooling coils clean. In humid climates, inspect components monthly.
v. Provide easy access for proper maintenance and inspection of the HVAC system, especially at coils, filters, dampers, and baffles.
w. Document Test and Balance reports of all HVAC systems following the installation. Report any deviations to specifications.
x. Locate outdoor air inlets away from standing water, soil, plant debris, accumulated bird or other animal droppings.
y. Prevent entrainment of rain, snow, or fog.
z. Locate inlets to building at least 50 feet away from cooling towers and evaporators.

II. Preventative Maintenance

A control program should include anticipation of conditions that may lead to contamination and implementation of preventive plans. The basic strategies should include routine surveillance inspections and prompt response to problems, adequate preventive maintenance of the building and HVAC systems, and adequate housekeeping including routine cleaning. These preventive measures are generally more cost effective than remediation of problems that were unrecognized and/or were ignored.

Cleaning is the final defense in managing the indoor environment. The routine use of high efficiency vacuum cleaners (HEPA Vacuuming), damp dusting, and quality cleaning products, particularly in high traffic areas can result in meaningful decreases in particulate contamination and the microbial growth it may support.

The use of biocides and antimicrobial agents is not recommended, due to their limitations (most designed to treat only limited types of microorganisms) and their potentially hazardous properties. Furthermore, killing microorganisms does not destroy their potential allergic properties. Even microbial growth that has been treated with a biocide still should be cleaned and removed from the building.

Remediation Activities

The objective of remediation is to remove or clean contaminated materials in a way that prevents fungal contamination from leaving a work area and entering a clean area. In addition, the health of the workers performing the remediation should be protected.

Remediation is based on areas impacted by the contamination. These levels are as follows:

I. Level I Contamination (Small Isolated areas of 10 ft^2 or less).

Personal Protective Equipment required: N95 disposable respirator (dust masks), gloves and eye protection (safety glasses).

a. Containment of the abatement area is necessary and shall not be occupied.
b. Dust suppression methods, such as misting mold contaminated surfaces before remediation is necessary.
c. The abatement area and other areas used by remedial workers should be cleaned with a damp cloth and/or mop and a detergent solution.
d. Mold contaminated materials that cannot be cleaned should be removed in a sealed plastic bag.
e. Materials to be reused should be dry and free from all visible mold.
f. Visually inspect for the existence of additional contaminated materials before opening previously contaminated area. All areas shall be dry and free from mold contamination and debris.

II. Level II Contamination (Mid-Sized Isolated Areas of 10 to 30 ft^2.)

Personal Protective Equipment required: N95 disposable respirator (dust masks), gloves and eye protection (safety glasses).

a. Containment of the abatement area is necessary and shall not be occupied.
b. The abatement area shall be covered with plastic sheets and sealed with tape before remediation.

c. Dust suppression methods, such as misting mold contaminated surfaces before remediation is necessary.
d. Install and use High Efficiency Particulate Air (HEPA) Filters for vacuuming and cleaning purposes. Vacuuming of HEPA filters shall be routed to the outside of the building area (exterior).
e. The abatement area and other areas used by remedial workers should be cleaned with a damp cloth and/or mop and a detergent solution.
f. Mold contaminated materials that cannot be cleaned should be removed in a sealed plastic bag.
g. Materials to be reused should be dry and free from all visible mold.
h. Visually inspect for the existence of additional contaminated materials before opening previously contaminated area. All areas shall be dry and free from mold contamination and debris.

III. Level III Contamination (Large Isolated Areas of 30 to 100 ft^2.)
To be performed by an authorized third party remediation company

Personal Protective Equipment required: N95 disposable respirator (dust masks), gloves and eye protection (safety glasses). Personnel exposed to the contamination shall be trained in handling of hazardous materials.

a. Containment of the abatement area is necessary and shall not be occupied.
b. The abatement area shall be covered with plastic sheets and sealed with tape before remediation.
c. Dust suppression methods, such as misting mold contaminated surfaces before remediation is necessary.
d. Install and use High Efficiency Particulate Air (HEPA) Filters for vacuuming and cleaning purposes. Vacuuming of HEPA filters shall be routed to the outside of the building area (exterior).
e. The abatement area and other areas used by remedial workers should be cleaned with a damp cloth and/or mop and a detergent solution.
f. Mold contaminated materials that cannot be cleaned should be removed in a sealed plastic bag.
g. Materials to be reused should be dry and free from all visible mold.
h. Visually inspect for the existence of additional contaminated materials before opening previously contaminated area. All areas shall be dry and free from mold contamination and debris.

IV. Level IV Contamination (Areas in excess of 100 ft^2.)
To be performed by an authorized third party remediation company

Personal Protective Equipment required: Full-face respirators with HEPA cartridges), disposable protective clothing from head to toe, gloves and eye protection (safety glasses). Personnel exposed to the contamination shall be trained in handling of hazardous materials.

a. Thorough isolation of the contaminated area is necessary. The abatement area shall be covered with plastic sheets and sealed with tape before remediation.
b. Strict control of occupancy (only personnel performing decontamination). Vacate people from spaces adjacent to the area contaminated.
c. Establish negative pressure via the use of an exhaust fan with a HEPA filter.
d. Decontamination room.
e. Install and use High Efficiency Particulate Air (HEPA) Filters for vacuuming and cleaning purposes. Vacuuming of HEPA filters shall be routed to the outside of the building area (exterior).
f. All contaminated materials shall be removed in a sealed plastic bag. The outside of the bag shall be cleaned with a cloth and detergent before transport to the outside.
g. Materials to be reused should be dry and free from all visible mold.
h. The containment area and decontamination chamber should be HEPA vacuumed and cleaned with a damp cloth and/or mop with a detergent solution before removal of the isolation barriers.
i. Visually inspect for the existence of additional contaminated materials before opening previously contaminated area. Air monitoring should be conducted before occupancy to ensure the area is safe to reoccupy.

V. Level V Contamination (Small Isolated Areas of less than 10 ft^2 in an HVAC system).
To be performed by an authorized third party remediation company

Personal Protective Equipment required: N95 disposable respirator (dust masks), gloves and eye protection (safety glasses).

a. Shut down the HVAC system before proceeding with remedial activities.
b. The abatement area should be covered with plastic sheet(s) and sealed with duct tape before remediation.
c. Dust suppression methods, such as misting mold contaminated surfaces before remediation, are recommended.
d. Leave all areas dry and free from mold contamination and debris.
e. The abatement area and other areas used by remedial workers should be HEPA vacuumed and cleaned with a damp cloth and/or mop and a detergent solution.
f. HVAC manufacturer's recommended biocides should be used for cleaning of HVAC components, such as cooling coils, condensation pans, etc.
g. Visually inspect for the existence of additional contaminated materials before opening previously contaminated area.

VI. Level VI Contamination (Areas in excess of 10 ft2 in an HVAC system.)
To be performed by an authorized third party remediation company

Personal Protective Equipment required: Full-face respirators with HEPA cartridges), disposable protective clothing from head to toe, gloves and eye protection (safety glasses). Personnel exposed to the contamination shall be trained in handling of hazardous materials.

a. Shut down the HVAC system before proceeding with remedial activities.
b. Isolate the abatement area from other areas of the HVAC system with plastic sheeting and duct tape.
c. Establish negative pressure via the use of an exhaust fan with HEPA filter.
d. Dust suppression methods, such as misting mold contaminated surfaces before remediation, are recommended.
e. Remove contaminated materials and growth supporting materials on the interior lined ducts and filters and place in a sealed bag for disposal.
f. Leave all areas dry and free from mold contamination and debris.
g. The abatement area and other areas used by remedial workers should be HEPA vacuumed and cleaned with a damp cloth and/or mop and a detergent solution.
h. HVAC manufacturer's recommended biocides should be used for cleaning of HVAC components, such as cooling coils, condensation pans, etc.
i. Visually inspect for the existence of additional contaminated materials before opening previously contaminated area. Air monitoring should be conducted before occupancy with the HVAC system to ensure the area is free from additional contaminants.

Hazard Communication

All construction workers or occupants in the affected area(s) should be notified of its presence as part of your normal hazard communication program. The key to an effective workplace risk communication is the credibility of the information source and the trust the audience has in this person. Refer to Section 17 – Hazard Communications of the Doster Construction Company Safety Manual.

Water Intrusion Control Construction Checklist

Location: _____ **Date:** _____

Completed By: _____

Describe area being visually inspected: (specific location and materials)

_____

_____

Heating and Cooling Systems Operational: Y N **Room Temp.:**_____ ºF

Roofing Installed on Area:_____

Leaks Found: _____

Water Accumulation: _____

Types of Non-conformances (check if found):

Musty Smell	☐	**Surfaces with stains**	☐	**Window sills**	☐	**Ceilings**	☐
Walls	☐	**Plumb/Mech. Leaks**	☐	**Caulk/Sealants**	☐	**Other**	☐

Other: drainage and/or downspouts direct water away from building – sealed siding or other exterior building surfaces – outside sprinkler system away from building – roof vents allow ventilation – exterior water accumulation – ground slopes away from building

Explain Above:

_____

_____

_____

Any Corrective Actions (Please Explain):

_____

_____

_____

Attach any authorized third party remediation reports.

Photos Taken (Please attach to report):

_____ _____

Doster Construction Company Representative **Date**

Reference Guide: Table A. Potential Sources of Biological Agents in Buildings

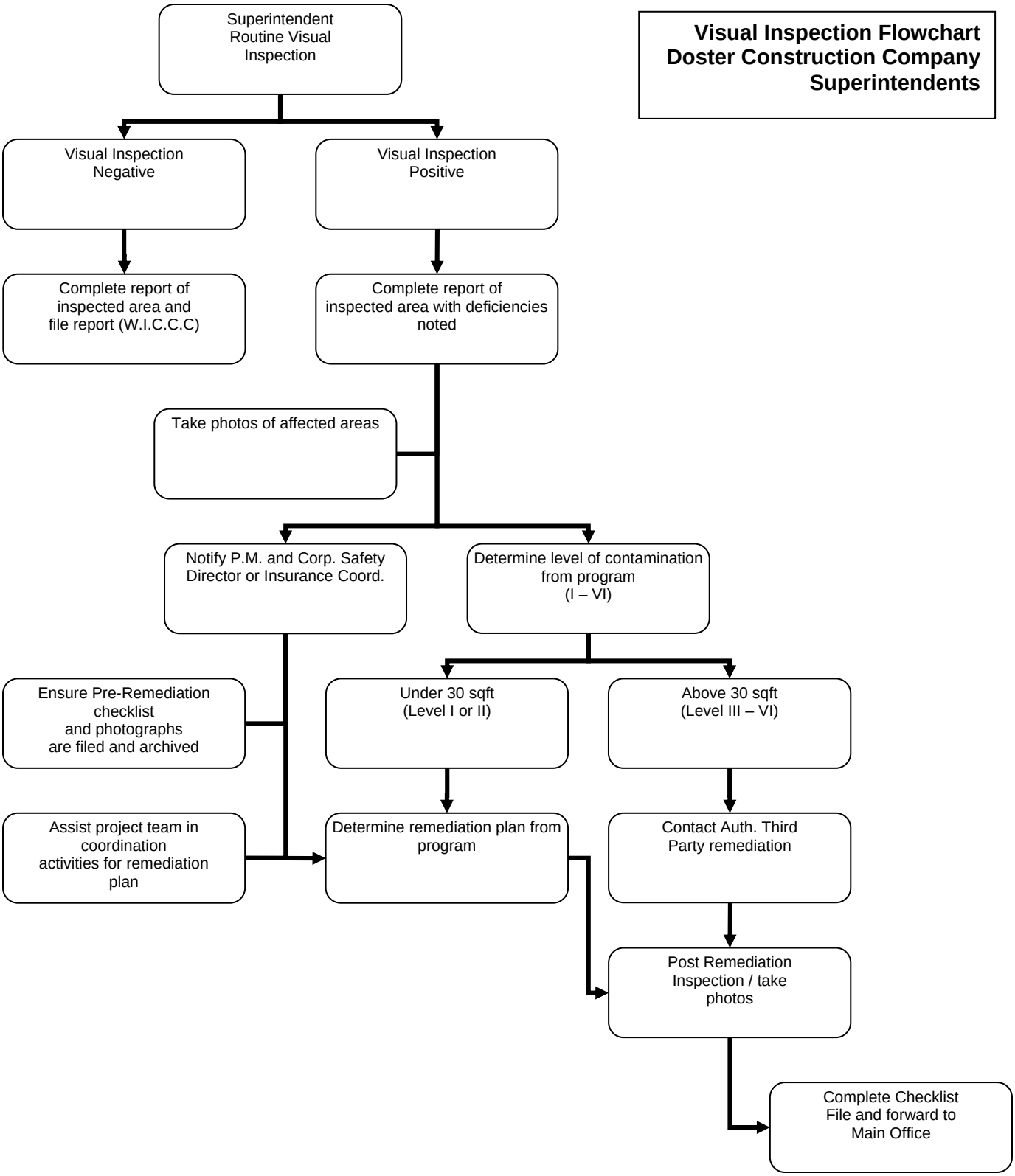
Source	Related Factors
Outdoors	
Outdoor air	Crop planting and harvesting-exposed soil, soil turning, or disturbance of plant materials; excavation or construction operations; wastewater treatment or irrigation; textile mills; slaughterhouses or rendering plants; composting operations
Building Exterior	Poor grading or water drainage; evidence of water intrusion (discoloration);blocked rain gutters; penetrations in siding or veneer; damage to building envelope; wood rot in structural timbers; animal infestation near building or in crawl space beneath building; automatic lawn sprinklers that wet exterior walls
HVAC System	
Outdoor air intakes (OAIs)	Bioaerosol sources near OAIs (e.g., plant debris, feathers and bird droppings, insect or rodent infestations, sanitary air vents, cooling towers or evaporative condensers, standing water); below-grade OAIs
Filters	Dampness; microbial growth on filters; gaps between filters and housings; low efficiency filters
Heat exchangers	Dirty heating or cooling coils; excessive water in condensate pans-inadequate drainage from collection pans; blow-through of water droplets onto surfaces downstream of coils; dampness and microbial growth on acoustical lining; poorly maintained air washers or humidifiers; stagnant water in air washers or humidifiers
Supply air plenums and ductwork	Excessive surface deposits; dampness and surface microbial growth; inaccessible humidifiers
Supply air diffusers	Surface deposits, rust, or microbial growth on louvers; soiling of adjacent ceilings and walls; poor air mixing
Occupied Space	
Water-damage	Evidence or history of plumbing or roof leaks, water intrusion or spills, high indoor humidity (>60%), attempts to clean or disinfect carpets and other materials, musty or moldy odors
Chronic condensation	Inadequate insulation or intrusion of humid outdoor air that results in chronic condensation on windows, perimeter walls, or other cool surfaces
Window air conditioners and evaporative air coolers	Location inconvenient for maintenance; dirty grilles; standing water in condensate pans or sumps; dampness and surface microbial growth in or near units
Fancoil and induction units	Dirty heating or cooling coils or filters; excessive water in condensate pans-inadequate drainage from collection pans; dampness and surface microbial growth near units
Potted plants	Microbial growth on leaves, soil, plant containers, or surfaces in contact with containers; excess moisture from overwatering
Carpet	Poorly maintained or water-damaged carpet that serves as a source for dirt accumulation or microbial growth
Fabric office partitions, wall coverings, drapes; upholstered furniture	Poorly maintained or water-damaged fabric-covered and upholstered items that serve as sources for dirt accumulation or microbial growth
Portable (console) humidifiers	Poorly maintained units with microbial growth in the water reservoirs; spray or mist units
Return air plenums	Excessive surface deposits; dampness and surface microbial growth

Reference: Liberty Mutual Group 2001. I.H. Training Memo: “Fungi and Mold in Indoor Environments”

References and Guides

- Liberty Mutual Bulletin - I.H. Training Memo: “Fungi and Mold in Indoor Environments” 2001
- Liberty Mutual Bulletin - “Guidelines for Contractors and Facility Owners – MOLD”
- Occupational Safety and Health Standards - 29 CFR 1910.1200 Hazard Communication
- Occupational Safety and Health Standards – 29 CFR 1910.134 Respiratory Protection

Visual Inspection Flowchart
Doster Construction Company
Superintendents



Section 22
Fire Prevention and Welding and Cutting

Fire Prevention for Construction

1) Good Housekeeping shall be maintained in all work areas. (Accumulation of flammables is prohibited.)

2) Fire protection equipment will be provided in all areas where combustible materials are present. Regular inspections will be made by the Safety Department to assure that fire extinguishers, hoses, reels and hydrants are in good working order. No unauthorized use of fire hydrants, hose stations and PIV valves will be permitted without authorization from the Safety Department.

3) A clear access to all fire protection equipment will be maintained. (Includes extinguishers, hose reels, hydrants, etc.)

4) Fire protection equipment is to be used only for that purpose.

5) Fire lanes inside of all buildings shall be maintained and kept clear for safe egress.

6) In certain industrial plant areas, smoking will be permitted only in designated areas.

7) "Strike anywhere" matches are not to be used on the project.

Flammable Liquids and Gases

1) Only approved Safety containers shall be used for handling, dispensing and storage of flammable/combustible liquids.

2) Storage of flammable/combustible liquids shall be only in an approved area and in an approved cabinet or cage.

3) At no time are plastic containers to be used on any Doster Construction Company job for the purpose of keeping flammable/combustible liquids.

Cutting and Welding

1) The areas of welding and cutting operations (especially below) shall be continually watched during and immediately after the operation.

2) All welding and cutting operations shall have fire extinguishers in the immediate area. The proper fire extinguishers for use by fire watch are to be made available by the contractor performing the operation.

3) Fire blankets are to be used to retain all sparks, slag or hot pieces of metal to prevent contact with a flammable/combustible substance, electrical circuitry, machinery, equipment or people.

4) Practical welding screens are to be used to protect personnel from ultra-violet rays (flash burns).

5) For the elimination of possible fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be shut off. Whenever the torch is not to be used or whenever the torch is left unattended for a substantial time, the torch and hose shall be removed from the confined space. Open ended fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch.

Requirements

To prevent ignition hazards, electrical wiring and equipment shall be installed in accordance with the National Electrical Code, NFPA 70-1975.

A fire extinguisher rated not less than 5A shall be provided for each 3,000 square feet of Building area and in each yard storage area. Travel distance to any fire extinguisher shall not exceed 75 feet from any protected area inside or outside a building.

One or more extinguishers rated not less than 5A shall be located on each floor of a multi-stored building. At least one 5A-rated extinguisher shall be located adjacent to a stairway in a multi-stored building. Extinguishers rated not less than 10B shall be provided within 50 feet of any area in which more then five (5) gallons of flammable or combustible liquids or five (5) pounds of flammable gas are being used.

Carbon tetrachloride extinguishers are prohibited. Extinguishers shall be conspicuously located where they shall be readily accessible and immediately available in case of fire, and their locations shall be conspicuously marked. Extinguishers shall be installed on hangers or in the brackets provided.

Fire Watch and Fire Extinguisher Training

Fire watch will:

1) If applicable, obtain the Client Open Flame and Spark Hazard Permit for the proposed work.

2) Verify that the "Required" items on the permit have been completed before any work is allowed to begin and report any problems.

3) Monitor the area where the work is being performed to ensure that it remains free of any flammable or combustible materials.

4) Ensure necessary fire protection devices are immediately available at all times.

5) If available, provide continuous Lower Flammable Limits (LFL) monitoring with an approved meter and stop work if a flammable/combustible atmosphere is detected or other permit requirements are not meet. Readings should be recorded every 30 minutes on the permit.

6) Use the fire extinguishing equipment to extinguish incipient stage fires. There must be at least one approved fire extinguisher for each fire-watch.

7) Any uncontrollable fire shall be notified to local authorities and to the Emergency Coordinator and Corporate Safety Director as required on Section 8 – Emergency Response / Action Plan (refer to Fire and Explosion). Employees shall leave the area of an uncontrollable fire immediately. Implement Doster Construction Company's Crisis Management Plan.

8) Help insure containment of sparks and slag.

9) maintain watch for 30 minutes after operation to ensure no fire develops; and

10) Be identified by wearing an orange vest and if applicable, displaying the authorized fire-watch certification card attached to the vest.

11) Never leave the permitted area while work is in progress unless relieved by another qualified fire-watch.

Inspections

Extinguishers shall be inspected monthly or more often when circumstances warrant, to ensure that they have not been actuated or tampered with, and to detect any damage. Inspection tags shall be placed on them (or, a tracking system, which matches the tag to the extinguisher if keeping the tags on is a problem), and the date of inspection shall be indicated after each inspection. Records should be maintained for one (1) year. Documentation of inspections and servicing shall be maintained.

Each extinguisher shall have a durable tag, securely attached to show the maintenance test and recharge date and the initials or signature of the person who performed the services. A discharged fire extinguisher shall be removed from service immediately and replaced.

On-Site Burning of Materials

Doster Construction Company allows the burning of materials onsite only if the local building permits allows for it to do so. No burning of materials shall be allowed on a Doster Construction Company jobsite if the local authorities have not been contacted and coordinated, i.e. Local Fire Department.

Absolutely no burning of materials which releases toxic or hazardous agents or contaminants to the human or environmental health is permitted under this program.

Section 23
Tool Safety

Hand & Power Tool Audit

Hand & Power Tool Audit

Jobsite _____ Area _____

Auditor _____ Date _____

Area	Satisfactory	Action Required	Corrective Action (date)
Employee Knowledge			
Date Last Tool Training			
Hazards of faulty or improperly used tools			
Pre-Use Inspection			
Electrical Hazards			
Tool Adjustments			
Sharpening Procedures			
Proper Storage			
Program Administration			
Person Assigned for tool checkout / repair			
Designated Area for tool storage			
Respirators required when cutting fluid use creates mist			
Safeguards			
Engineering Safeguards			
Administrative Safeguards			
Training Safeguards			
Area Inspection			
Eye Hearing Protection Used			
Bench Grinders Adjusted			
Equipment mounted to			

floor			
Machine guards in place			
Warning signs posted in shops			
Storage area neat, dry			
Tools in good condition			
Blades & cutting edges sharp			
Face Shields used at grinders			
Grinding wheels dressed			
Rigging equipment tested			

Operational Questions

(1) Are all tools and equipment (both company and employee owned) used by employees at their workplace in good condition?

(2) Are hand tools such as chisels and punches, which develop mushroomed heads during use, reconditioned or replaced as necessary?

(3) Are broken or fractured handles on hammers, axes and similar equipment replaced promptly?

(4) Are worn or bent wrenches replaced regularly?

(5) Are appropriate handles used on files and similar tools?

(6) Are employees made aware of the hazards caused by faulty or improperly used hand tools?

(7) Are appropriate safety glasses, face shields, etc. used while using hand tools or equipment which might produce flying materials or be subject to breakage?

(8) Are jacks checked periodically to ensure they are in good operating condition?

(9) Are tool handles wedged tightly in the head of all tools?

(10) Are tool cutting edges kept sharp so the tool will move smoothly without binding or skipping?

(11) Are tools stored in dry, secure locations where they won't be tampered with?

(12) Is eye and face protection used when driving hardened or tempered spuds or nails?

(13) Are grinders, saws and similar equipment provided with appropriate safety guards?

(14) Are power tools used with the correct shield, guard, or attachment, recommended by the manufacturer?

(15) Are portable circular saws equipped with guards above and below the base shoe? Are circular saw guards checked to assure they are not wedged up, thus leaving the lower portion of the blade unguarded?

(16) Are rotating or moving parts of equipment guarded to prevent physical contact?

(17) Are all cord-connected, electrically operated tools and equipment effectively grounded or of the approved double insulated type?

(18) Are effective guards in place over belts, pulleys, chains, sprockets, on equipment such as concrete mixers, and air compressors?

(19) Are portable fans provided with full guards or screens having openings ½ inch or less?

(20) Is hoisting equipment available and used for lifting heavy objects, and are hoist ratings and characteristics appropriate for the task?

(21) Are ground-fault circuit interrupters provided on all temporary electrical 15 to 20 ampere circuits, used during periods of construction?

(22) Are pneumatic and hydraulic hoses on power operated tools checked regularly for deterioration or damage?

Section 24
Signs, Barricades and Fencing

Barricades act as warning devices, alerting others of the hazards created by construction activities, and should be used to control traffic, both vehicular and pedestrian, safely through or around the work site. Contractors should use barricades as required in 29 CFR 1926 Subpart G -Signs, Signals, and Barricades, or wherever necessary for the physical protection of people or property. Temporary cyclone fencing, plastic safety fencing and portable manhole barricades are examples of acceptable barricading. Yellow caution tape and/or cones are not considered acceptable barricades, and should be used only until more suitable barricades can be erected. Signage and illumination should be used where appropriate.
In addition, the following are examples of activities where barricade use is required by code or regulation.

Contractors should barricade the following areas:

1) Wherever construction debris is dropped without the use of an enclosed chute (29 CFR 1926 – Demolition).
2) Areas with temporary wiring operating at more than 600 volts (29 CFR 1926 Subpart K – Electrical).
3) Work areas for electrical equipment with exposed, energized parts (29 CFR 1926 Subpart K – Electrical).
4) The swing radius of the rotating superstructure of cranes or other equipment (29 CFR 1926 Subpart N – Cranes, Derricks, Hoists, Elevators, and Conveyors).
5) Wherever equipment is left unattended near a roadway at night (29 CFR 1926 Subpart O – Motor Vehicles, Mechanized Equipment, and Marine Operations).
6) Excavations (29 CFR 1926 Subpart P – Excavations).
7) Areas used for the preparation of explosive charges or blasting operations (29 CFR 1926 Subpart U – Blasting and Use of Explosives).
8) Street openings, such as manholes (multiple requirements found in 29 CFR 1926).
9) Construction areas in energized electrical substations (29 CFR 1926 Subpart V - Power Transmission and Distribution).

Section 25
Stairways and Ladders

Stairways

1) A stairway or ladder must be provided at all points of access where there is a break in elevation of 19 inches or more and no ramp, runway, embankment or personnel hoist is provided.

2) When there is only one point of access between levels, it must be kept clear to permit free passage by workers. If free passage becomes restricted, a second point of access must be provided and used.

3) When there are more than two points of access between levels, at least one point of access must be kept clear.

4) All stairway and ladder fall protection systems that are required to protect employees must be installed before employees begin work that requires them to use these stairways or ladders. When feasible, employees must be protected by personal fall arrest systems or other fall protection systems during erection of the stairs or ladders.

5) Stairways that will not be a permanent part of the structure and on which construction work is performed must have landings at least 30 inches deep and 22 inches wide at every 12 feet or less of vertical rise.

6) Stairways must be installed at least 30 degrees, and no more than 50 degrees, from the horizontal.

7) Where doors or gates open directly onto a stairway, a platform must be provided that extends at least 20 inches beyond the swing of the door.

8) Except during construction of the actual stairway, stairways with metal pan landings and treads must not be used where the treads and/or landings have not been filled in with concrete or other material, unless the pans of the stairs and/or landings are temporarily filled in with wood or other material. All treads and landings must be replaced when worn below the top edge of the pan.

9) Stairways having four or more risers, or rising more than 30 inches in height, whichever is less, must have at least one handrail. A stair rail also must be installed along each unprotected side or edge.

10) The height of the top edge of a stair rail system used as a handrail must not be more than 37 inches nor less than 36 inches from the upper surface of the stair rail system to the surface of the tread.

11) Winding or spiral stairways must be equipped with a handrail to prevent using areas where the tread width is less than 6 inches (15 cm).

12) Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members must be provided between the top rail and stairway steps of the stair rail system.

13) Midrails, when used, must be located midway between the top of the stair rail system and the stairway steps.

14) The height of handrails must be no more than 37 inches nor less than 30 inches from the upper surface of the handrail to the surface of the tread.

15) Temporary handrails must have a minimum clearance of 3 inches between the handrail and walls, stair rail system, and other objects.

16) Unprotected sides and edges of stairway landings must be provided with standard 42-inch guardrail systems.

Ladders

Ladders are indispensable tools. We take them for granted in our day-to-day work, but they're not always easy to use and can cause serious injuries unless used properly.

Each job site using ladders is expected to:

1) **Assure that employees are trained and can inspect, select and use ladders properly.**

2) Assure that ladders are inspected before use. Portable and fixed ladders with structural defects such as broken or missing rungs, cleats or steps, broken or split rails, or corroded components must be withdrawn from service by immediately tagging "DO NOT USE" or marking in a manner that identifies them as defective. **Per Doster Construction Company, Inc., damaged ladders cannot be repaired.**

Portable Ladder Use

1) Portable ladders (extension or self supporting) constructed from any conductive material (aluminum) are not permitted on Doster Construction Company, Inc. jobsites.

2) Match tasks to the appropriate ladder.

3) Protect the base of the ladder if vehicles, pedestrians, or an unlocked, unguarded door could strike it.

4) Face the ladder at all times, and **maintain three points of contact**.

5) Raise and lower heavy, awkward loads or tools using a hand line or hoist; don't attempt to carry them up the ladder.

6) Portable ladders must be placed on a substantial base and have clear access at top and bottom. **Do not use wood planks, stones or other unstable materials to level the base of a ladder**.

7) Place the base of extension ladders one foot out for every four foot of height to the wall or top support.

8) Keep the load on the ladder below its rated capacity.

9) Don't paint ladders-this will conceal defects.

10) Don't reach out over the side rails, lean, or turn excessively on a ladder. Reposition the ladder if you can't reach the work.

11) **Don't stand or sit on the top two steps of a stepladder**.

12) Don't use a non-self-supporting ladder without first opening it up and securing the metal spreader or locking device.

13) Store ladders in well ventilated areas away from moisture or excessive heat. Store straight or extension ladders in flat racks or wall brackets, making sure they don't sag. Store stepladders vertically in a closed position, and secure them so they won't tip over.

14) Job-made ladders must be constructed for their intended use. Cleats must be uniformly spaced not less than 10 inches apart, nor more than 14 inches apart, along the handrails.

15) Ladders must not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental movement. Slip-resistant feet must not be used as a substitute for the care in placing, lashing, or holding a ladder upon a slippery surface.

16) Fall protection may be required on fixed ladders and some portable ladders depending on individual requirements. When in doubt consult your Project Safety Manager. See **Section 13** on Fall Protection.

17) Read and follow the manufacturer's instructions.

Special Considerations

Work conducted around energized electrical systems must follow the requirements of the Doster Construction Company Electrical Safety Program.

Fall protection may be required, even when using movable ladders.

Where the total length of climb on a fixed ladder is 20 or more feet (except on chimneys), or where but the top of the ladder is more than 20 feet above lower levels, the ladder must be equipped with either:

1) Ladder safety devices,

2) Self-retracting lifeline and rest platforms at intervals not to exceed 20 feet, or

3) A cage or well and multiple ladder sections. The ladder sections must be offset from one another, and landing platforms must be provided at no more than 30-foot intervals.

Employees who use ladder safety devices or self-retracting lifelines must be trained to use this equipment properly.

Section 26
Scaffolding & Platforms

Scope:

This section establishes safety requirements for the construction, operation, maintenance, and use of scaffolds.

Scaffold means any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage), used for supporting employees or materials or both.

Capacity

Scaffolds must be able to support its own weight and 4X the maximum intended load and must be designed by a qualified person.

Platforms

Platforms must be fully planked with no more than 1-inch gaps, they must be at least 18-inches wide, guardrails mid-rails and toe boards around all platforms.

Employees are prohibited from working on scaffolds covered with snow, ice, and accumulated debris except to remove the hazards. Working from scaffolds is prohibited during storms or high winds.

Access to Scaffolds

Access to scaffold platforms more than two feet above or below the point of access must be made by portable/attachable ladders, ramps or stair towers. Employees are strictly forbidden to use braces to climb the scaffold. Provisions need to be made to provide adequate number of access/egress points on the scaffold depending on the number of employees working on them (1 access per 20 employees). Additionally, access/egress ladders need to be within 25' horizontal distance from the work.

Falling Object Protection

It is Doster Construction Company, Inc. policy that all employees working on scaffolds must wear hardhats. If there is a potential for falling hand tools, debris, and other objects from higher work levels, then the employees must be protected through the installation of toe boards, screens, debris nets or canopy structures.

The fall zone under scaffolding must be delineated with barricades or caution tape to protect employees working below scaffolds.

Electrocution

Scaffolds must not be erected, used, dismantled, altered, or moved so that they, or any conductive material handled on them, might come closer than 10 feet to energized overhead power lines.

General Requirements For All Scaffolds

1) Competent Person has to be identified to be responsible for scaffold inspection, erection, and dismantling.

2) All scaffolds shall be thoroughly inspected on a daily basis and tagged by a Competent Person, completing the Daily Scaffold Checklist/Inspection Form which can be found at the end of this section. Tagging should be done so all employees are aware that the scaffold is ready for use. At any time scaffolds can be deemed unsafe by the Competent Person and tagged to that effect, identifying the hazard to be corrected. All hazards identified are required to be corrected before resuming work on the scaffold.

3) Scaffolds shall be furnished and erected in accordance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction, except that ladders used for such work shall conform to §1910.25 and §1910.26.

4) The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, concrete blocks, or plywood shall not be used to support

scaffolds or planks. If wood sills are used, they should be of scaffold grade lumber and nailed to scaffold legs to prevent displacement.

5) Scaffolds and their components shall be capable of supporting without failure at least four times the maximum intended load.

6) Scaffolds and other devices mentioned or described in this section shall be maintained in safe condition. Scaffolds shall not be altered or moved horizontally while they are in use or occupied.

7) Any scaffold component damaged or weakened from any cause shall be immediately removed from service and disposed of.

8) Scaffolds shall not be loaded in excess of the working load for which they are intended.

9) All load-carrying timber members of scaffold framing shall be a minimum of 1,500 *f.* (Stress Grade) construction grade lumber. All dimensions are nominal sizes as provided in the American Lumber Standards, except that where rough sizes are noted, only rough or undressed lumber of the size specified will satisfy minimum requirements. (NOTE: Where nominal sizes of lumber are used in place of rough sizes, the nominal size lumber shall be such as to provide equivalent strength to that specified in tables D-7 through D-12 and D-16.) [1]

10) All planking shall be Scaffold Grade as recognized by grading rules for the species of wood used. The maximum permissible spans for 2- × 9-inch or wider planks are shown in the following table:

Material					
	Full thickness undressed lumber			Nominal thickness lumber	
Working load (p.s.f.)	25	50	75	25	50
Permissible span (ft.)	10	8	6	8	9

11) The maximum permissible span for 1 1/4×9-inch or wider plank of full thickness is 4 feet with medium loading of 50 p.s.f.

[1] OSHA Standards for the Construction Industry

12) Nails or bolts used in the construction of scaffolds shall be of adequate size and in sufficient numbers at each connection to develop the designed strength of the scaffold. Nails shall not be subjected to a straight pull and shall be driven full length.

13) All planking or platforms shall be overlapped (minimum 12 inches) or secured from movement.

14) Scaffold planks shall extend over their end supports not less than 6 inches nor more than 18 inches.

15) The poles, legs, or uprights of scaffolds shall be plumb, and securely and rigidly braced to prevent swaying and displacement.

16) Materials being hoisted onto a scaffold shall have a tag line.

17) All scaffolds should be barricaded as to prevent other trades/workers to walk under scaffold. See Controlled Access Zone.

18) Employees shall not work on scaffolds during storms or high winds.

19) Employees shall not work on scaffolds which are covered with ice or snow, unless all ice or snow is removed and planking sanded to prevent slipping.

20) Tools, materials, and debris shall not be allowed to accumulate in quantities to cause a hazard.

21) Only treated or protected fiber rope shall be used for or near any work involving the use of corrosive substances or chemicals.

22) Wire or fiber rope used for scaffold suspension shall be capable of supporting at least six times the intended load.

23) When acid solutions are used for cleaning buildings over 50 feet in height, wire rope supported scaffolds shall be used.

24) The use of shore scaffolds or lean-to scaffolds is prohibited.

[1] OSHA Standards for the Construction Industry

25) Lumber sizes, when used in this section, refer to nominal sizes except where otherwise stated.

26) Scaffolds shall be secured to permanent structures, through use of anchor bolts, reveal bolts, or other equivalent means at vertical intervals no greater than 26’ and 30’ horizontal.

27) Special precautions shall be taken to protect scaffold members, including any wire or fiber ropes, when using a heat-producing process.

General requirements for wood pole scaffolds [1]

1) Scaffold poles shall bear on a foundation of sufficient size and strength to spread the load from the poles over a sufficient area to prevent settlement. All poles shall be set plumb.

2) Where wood poles are spliced, the ends shall be squared and the upper section shall rest squarely on the lower section. Wood splice plates shall be provided on at least two adjacent sides and shall not be less than 4 feet 0 inches in length, overlapping the abutted ends equally, and have the same width and not less than the cross-sectional area of the pole. Splice plates of other materials of equivalent strength may be used.

3) Independent pole scaffolds shall be set as near to the wall of the building as practicable.

4) All pole scaffolds shall be securely guyed or tied to the building or structure. Where the height or length exceeds 25 feet, the scaffold shall be secured at intervals not greater than 25 feet vertically and horizontally.

5) Putlogs or bearers shall be set with their greater dimensions vertical, long enough to project over the ledgers of the inner and outer rows of poles at least 3 inches for proper support.

6) Every wooden putlog on single pole scaffolds shall be reinforced with a 3/16×2-inch steel strip or equivalent secured to its lower edge throughout its entire length.

7) Ledgers shall be long enough to extend over two pole spaces. Ledgers shall not be spliced between the poles. Ledgers shall be reinforced by bearing blocks securely nailed to the side of the pole to form a support for the ledger.

[1] OSHA Standards for the Construction Industry

8) Diagonal bracing shall be provided to prevent the poles from moving in a direction parallel with the wall of the building, or from buckling.

9) Cross bracing shall be provided between the inner and outer sets of poles in independent pole scaffolds. The free ends of pole scaffolds shall be cross braced.

10) Full diagonal face bracing shall be erected across the entire face of pole scaffolds in both directions. The braces shall be spliced at the poles.

11) Platform planks shall be laid with their edges close together so the platform will be tight with no spaces through which tools or fragments of material can fall.

12) Where planking is lapped, each plank shall lap its end supports at least 12 inches. Where the ends of planks abut each other to form a flush floor, the butt joint shall be at the centerline of a pole. The abutted ends shall rest on separate bearers. Intermediate beams shall be provided where necessary to prevent dislodgment of planks due to deflection, and the ends shall be nailed or cleated to prevent their dislodgment.

13) When a scaffold turns a corner, the platform planks shall be laid to prevent tipping. The planks that meet the corner putlog at an angle shall be laid first, extending over the diagonally placed putlog far enough to have a good safe bearing, but not far enough to involve any danger from tipping. The planking running in the opposite direction at right angles shall be laid so as to extend over and rest on the first layer of planking.

14) When moving platforms to the next level, the old platform shall be left undisturbed until the new putlogs or bearers have been set in place, ready to receive the platform planks.

15) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1 × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

16) All wood pole scaffolds 60 feet or less in height shall be constructed and erected in accordance with tables D-7 through D-12 of this section. If they are over 60 feet in height they shall be designed by a registered professional engineer and constructed and erected in accordance with such design. A copy of the typical drawings and specifications shall be made available to the employer and for inspection purposes.

17) Wood-pole scaffolds shall not be erected beyond the reach of effective firefighting apparatus.

Table D-7 Minimum Nominal Size and Maximum Spacing of members of Single Pole Scaffolds – Light duty		
	Maximum height of scaffold	
	20 feet	60 feet
Uniformly distributed load	Not to exceed 25 pounds per square foot	
Poles or uprights	2” X 4”	4” X 4”
Pole spacing (longitudinal)	6’0”	10’0”
Maximum width of scaffold	5’0”	5’0”
Bearers or putlogs to 3’0” width	2” X 4”	2” X 4”
Bearers or putlogs 5’0” width	2” X 6” OR 3” X 4”	2” X 6” OR 3” X 4” (rough)
Ledgers	1” X4”	1-1/4” X 9”
Planking	1-1/4” X 9” (rough)	2” X 9”
Vertical spacing of horizontal members	7’0”	7’0”
Bracing, horizontal and diagonal	1” X 4”	1” X 4”
Tie-ins	1” X 4”	1” X 4”
Toe boards	4” high (minimum)	4” high (minimum)
Guardrail	2” X 4”	2” X 4”
All members except planking are used on edge.		

Table D-8 – Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds – Medium Duty	
Uniformly distributed load	Not to exceed 50 pounds per square foot
Maximum height of scaffold	60’
Poles or uprights	4”x 4”
Pole spacing (longitudinal)	8’0”
Maximum width of scaffold	5’0”

Bearers or putlogs	2”x9” or 3”x4”
Spacing of bearers or putlogs	8’0”
Ledgers	2”x9”
Vertical spacing of horizontal members	9’0”
Bracing, horizontal	1”x6” or 1-1/4”x4”
Bracing, diagonal	1”x4”
Tie-ins	1”x4”
Planking	2”x9”
Toe-boards	4” high (minimum)
Guardrail	2”x4”
All members except planking are used on edge.	

Table D-9 – Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds – Heavy Duty	
Uniformly distributed load	Not to exceed 75 pounds per square foot.
Maximum height of scaffold	60’
Poles or uprights	4”x4”
Pole spacing (longitudinal)	6’0”
Maximum width of scaffold	5’0”
Bearers or putlogs	2”x9” or 3”x5” (rough)
Spacing of bearers or putlogs	6’0”
Ledgers	2”x9”
Vertical spacing of horizontal members	6’6”
Bracing, horizontal and diagonal	2”x4”
Tie-ins	1”x4”
Planking	2”x9”
Toe-boards	4” high (minimum)
Guardrail	2”x4”
All members except planking are used on edge.	

Table D-10 – Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds – Light Duty		
	Maximum height of scaffold	
	20 feet	60 feet
Uniformly distributed load	Not to exceed 25 pounds per square foot	

Poles or uprights	2”x4”	4”x4”
Pole spacing (longitudinal)	6’0”	10’0”
Pole spacing (transverse)	6’0”	10’0”
Ledgers	1-1/4”x4”	1-1/4”x9”
Bearers to 3’0” span	2”x4”	2”x4”
Bearers to 10’0” span	2”x6” or 3”x4”	2”x9” (rough) or 3”x8”
Planking	1-1/4”x9”	2”x9”
Vertical spacing of horizontal members	7’0”	7’0”
Bracing, horizontal and diagonal	1”x4”	1”x4”
Tie-ins	1”x4”	1”x4"
Toe boards	4” high	4” high (minimum)
Guardrail	2”x4”	2”x4”
All members except planking are used on edge.		

Table D-11 – Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds – Medium Duty	
Uniformly distributed load	Not to exceed 50 pounds per square foot
Maximum height of scaffold	60’
Poles or uprights	4”x4”
Pole spacing (longitudinal)	8’0”
Pole spacing (transverse)	8’0”
Ledgers	2”x9”
Vertical spacing of horizontal members	6’0”
Spacing of bearers	8’0”
Bearers	2”x9” (rough) or 2”x10”
Bracing, horizontal	1”x6” or 1-1/4”x4”
Bracing, diagonal	1”x4”
Tie-ins	1”x4”
Planking	2”x9”
Toe boards	4” high (minimum)
Guardrail	2”x4”
All members except planking are used on edge.	

Table D-12 – Minimum Nominal Size and Maximum Spacing of Members of Independent pole Scaffolds – Heavy Duty	
Uniformly distributed load	Not to exceed 75 pounds per square foot.
Maximum height of scaffold	60’
Poles or uprights	4”x4”

Pole spacing (longitudinal)	6’0”
Pole spacing (transverse)	8’0”
Ledgers	2”x9”
Vertical spacing of horizontal members	4’6”
Bearers	2”x9” (rough)
Bracing, horizontal and diagonal	2”x4”
Tie-ins	1”x4”
Planking	2”x9”
Toe boards	4” high (minimum)
Guardrail	2”x4”
All members except planking are used on edge.	

Table D-13 – Tube and Coupler Scaffolds – Light Duty		
Uniformly distributed load	Not to exceed 25 pounds per square foot	
Post spacing (longitudinal)	10’0”	
Post spacing (transverse)	6’0”	
Working Levels	Additional Planked Levels	Maximum Height
1	8	125’
2	4	125’
3	0	91’0”

Table D-14 – Tube and Coupler Scaffolds – Medium Duty		
Uniformly distributed load	Not to exceed 50 pounds per square foot	
Post spacing (longitudinal)	8’0”	
Post spacing (transverse)	6’0”	
Working Levels	Additional Planked Levels	Maximum Height
1	6	125’
2	0	78’0”

Table D-15 – Tube and Coupler Scaffolds – Heavy Duty		
Uniformly distributed load	Not to exceed 75 pounds per square foot	
Post spacing (longitudinal)	6’6”	
Post spacing (transverse)	6’0”	
Working Levels	Additional Planked Levels	Maximum Height
1	6	125’

Tube and coupler scaffolds [1]

1) A light-duty tube and coupler scaffold shall have all posts, bearers, runners, and bracing of nominal 2-inch O.D. steel tubing. The posts shall be spaced no more than 6 feet apart

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by 10 feet along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load.

2) A medium-duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing. Posts spaced not more than 6 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2 1/2-inch O.D. steel tubing. Posts spaced not more than 5 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2-inch O.D. steel tubing. Other structural metals when used must be designed to carry an equivalent load.

3) A heavy-duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing, with the posts spaced not more than 6 feet apart by 6 feet 6 inches along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load.

4) Tube and coupler scaffolds shall be limited in heights and working levels to those permitted in tables D-13, 14, and 15, of this section. Drawings and specifications of all tube and coupler scaffolds above the limitations in tables D-13, 14, and 15 of this section shall be designed by a registered professional engineer and copies made available to the employer and for inspection purposes.

5) All tube and coupler scaffolds shall be constructed and erected to support four times the maximum intended loads as set forth in tables D-13, 14, and 15 of this section, or as set forth in the specifications by a registered professional engineer, copies which shall be made available to the employer and for inspection purposes.

6) All tube and coupler scaffolds shall be erected by competent and experienced personnel.

7) Posts shall be accurately spaced, erected on suitable bases, and maintained plumb.

8) Runners shall be erected along the length of the scaffold located on both the inside and the outside posts at even height. Runners shall be interlocked to form continuous lengths and coupled to each post. The bottom runners shall be located as close to the base as possible. Runners shall be placed not more than 6 feet 6 inches on centers.

9) Bearers shall be installed transversely between posts and shall be securely coupled to the posts bearing on the runner coupler. When coupled directly to the runners, the coupler must be kept as close to the posts as possible.

10) Bearers shall be at least 4 inches but not more than 12 inches longer than the post spacing or runner spacing. Bearers may be cantilevered for use as brackets to carry not more than two planks.

11) Cross bracing shall be installed across the width of the scaffold at least every third set of posts horizontally and every fourth runner vertically. Such bracing shall extend diagonally from the inner and outer runners upward to the next outer and inner runners.

12) Longitudinal diagonal bracing shall be installed at approximately a 45-degree angle from near the base of the first outer post upward to the extreme top of the scaffold. Where the longitudinal length of the scaffold permits, such bracing shall be duplicated beginning at every fifth post. In a similar manner, longitudinal diagonal bracing shall also be installed from the last post extending back and upward toward the first post. Where conditions preclude the attachment of this bracing to the posts, it may be attached to the runners.

13) The entire scaffold shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.

14) Guardrails not less than 2×4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1×4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

Tubular welded frame scaffolds [1]

1) Metal tubular frame scaffolds, including accessories such as braces, brackets, trusses, screw legs, ladders, etc., shall be designed and proved to safely support four times the maximum intended load.

2) Spacing of panels or frames shall be consistent with the loads imposed.

3) Scaffolds shall be properly braced by cross bracing or diagonal braces, or both, for securing vertical members together laterally, and the cross braces shall be of such

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length as will automatically square and align vertical members so that the erected scaffold is always plumb, square, and rigid. All brace connections shall be made secure.

4) Scaffold legs shall be set on adjustable bases or plain bases placed on mud sills or other foundations adequate to support the maximum intended load. All legs on scaffold shall be secure to mudsills with nails to avoid displacement.

5) The frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alignment of the legs.

6) Where uplift may occur, panels shall be locked together vertically by pins or other equivalent suitable means.

7) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

8) All tubular metal scaffolds shall be constructed and erected to support four times the maximum intended loads.

9) To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically.

10) Maximum permissible spans of planking shall be in conformity with OSHA Standards for the Construction Industry found in CFR 1926 Subpart L.

11) Drawings and specifications for all frame scaffolds over 125 feet in height above the base plates shall be designed by a registered professional engineer and copies made available to the employer and for inspection purposes.

12) All tubular welded frame scaffolds shall be erected by competent and experienced personnel.

13) Frames and accessories for scaffolds shall be maintained in good repair. Any broken, bent, excessively rusted, altered, or otherwise structurally damaged frames or accessories shall not be used. Climbing bucks and cross braces for access or egress is strictly prohibited.

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14) Daily inspections shall be made of all welded frames and accessories, and any maintenance, including painting, or minor corrections authorized by the manufacturer, shall be made before further use.

Outrigger scaffolds [1]

1) Outrigger scaffolds shall be designed by a Registered Professional Engineer.

2) Outrigger beams shall extend not more than 6 feet beyond the face of the building. The inboard end of outrigger beams, measured from the fulcrum point to the extreme point of support, shall be not less than one and one-half times the outboard end in length. The beams shall rest on edge, the sides shall be plumb, and the edges shall be horizontal. The fulcrum point of the beam shall rest on a secure bearing at least 6 inches in each horizontal dimension. The beam shall be secured in place against movement and shall be securely braced at the fulcrum point against tipping.

3) The inboard ends of outrigger beams shall be securely supported either by means of struts bearing against sills in contact with the overhead beams or ceiling, or by means of tension members secured to the floor joists underfoot, or by both if necessary. The inboard ends of outrigger beams shall be secured against tipping and the entire supporting structure shall be securely braced in both directions to prevent any horizontal movement.

4) Unless outrigger scaffolds are designed by a licensed professional engineer, they shall be constructed and erected in accordance with table D-16. Outrigger scaffolds designed by a registered professional engineer shall be constructed and erected in accordance with such design. A copy of the detailed drawings and specifications showing the sizes and spacing of members shall be kept on the job.

5) Planking shall be laid tight and shall extend to within 3 inches of the building wall. Planking shall be nailed or bolted to outriggers.

6) Where there is danger of material falling from the scaffold, a wire mesh or other enclosure shall be provided between the guardrail and the toeboard.

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7) Where additional working levels are required to be supported by the outrigger method, the plans and specifications of the outrigger and scaffolding structure shall be designed by a registered professional engineer.

Masons' adjustable multiple-point suspension scaffolds

1) The scaffold shall be capable of sustaining a working load of 50 pounds per square foot and shall not be loaded in excess of that figure.

2) The scaffold shall be provided with hoisting machines that meet the requirements of a nationally recognized testing laboratory. Refer to §1910.7 for definition of nationally recognized testing laboratory.

Table D-16 – Minimum Nominal Size and Maximum Spacing of Members of Outrigger Scaffolds		
	Light Duty	Medium Duty
Maximum scaffold load	25 pounds per square foot	50 pounds per square foot
Outrigger size	2”x10”	3”x10”
Maximum outrigger spacing	10’0”	6’0”
Planking	2”x9”	2”x9”
Guardrail	2”x4”	2”x4”
Guardrail uprights	2”x4”	2”x4”
Toe boards (minimum)	4”	4”

3) The platform shall be supported by wire ropes in conformity with paragraph 12 of this section, suspended from overhead outrigger beams.

4) The scaffold outrigger beams shall consist of structural metal securely fastened or anchored to the frame or floor system of the building or structure.

5) Each outrigger beam shall be equivalent in strength to at least a standard 7-inch, 15.3-pound steel I-beam, be at least 15 feet long, and shall not project more than 6 feet 6 inches beyond the bearing point.

6) Where the overhang exceeds 6 feet 6 inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed in accordance with approved designs and instructions.

7) If channel iron outrigger beams are used in place of I-beams, they shall be securely fastened together with the flanges turned out.

8) All outrigger beams shall be set and maintained with their webs into vertical position.

9) A stop bolt shall be placed at each end of every outrigger beam.

10) The outrigger beam shall rest on suitable wood-bearing blocks.

11) All parts of the scaffold such as bolts, nuts, fittings, clamps, wire rope, and outrigger beams and their fastenings, shall be maintained in sound and good working condition and shall be inspected before each use.

12) The free end of the suspension wire ropes shall be equipped with proper size thimbles and be secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of rope shall at all times remain on the drum.

13) Where a single outrigger beam is used, the steel shackles or clevises with which the wire ropes are attached to the outrigger beams shall be placed directly over the hoisting drums.

14) The scaffold platform shall be equivalent in strength to at least 2-inch planking.

15) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1 × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

16) Overhead protection shall be provided on the scaffold at all times. Overhead protection can consist of 2-inch planking or material of equivalent strength laid tight.

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17) Each scaffold shall be installed or relocated in accordance with designs and instructions, of a registered professional engineer, and supervised by a competent, designated person.

Two-point suspension scaffolds (swinging scaffolds) [1]

1) All two-point suspension scaffolds shall be designed, erected, installed by a Certified Company or a Registered Professional Engineer.

2) Two-point suspension scaffold platforms shall be not less than 20 inches no more than 36 inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.

3) The hangers of two-point suspension scaffolds shall be made of wrought iron, mild steel, or other equivalent material having a cross-sectional area capable of sustaining four times the maximum intended load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.

4) When hoisting machines are used on two-point suspension scaffolds, such machines shall be of a design tested and approved by a nationally recognized testing laboratory. Refer to §1910.7 for definition of nationally recognized testing laboratory.

5) The roof irons or hooks shall be of wrought iron, mild steel, or other equivalent material of proper size and design, securely installed and anchored. Tie-backs of three-fourth inch manila rope or the equivalent shall serve as a secondary means of anchorage, installed at right angles to the face of the building whenever possible and secured to a structurally sound portion of the building.

6) Guardrails not less than 2 × 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- × 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

7) Two-point suspension scaffolds shall be suspended by wire or fiber ropes. Wire and fiber ropes shall conform to OSHA Standards for the Construction Industry Subpart L CFR 1926.

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8) The blocks for fiber ropes shall be of standard 6-inch size, consisting of at least one double and one single block. The sheaves of all blocks shall fit the size of rope used.

9) All wire ropes, fiber ropes, slings, hangers, platforms, and other supporting parts shall be inspected before every installation. Periodic inspections shall be made while the scaffold is in use.

10) On suspension scaffolds designed for a working load of 500 pounds no more than two men shall be permitted to work at one time. On suspension scaffolds with a working load of 750 pounds, no more than three men shall be permitted to work at one time. Each workman shall be protected by a safety lifebelt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall.

11) Where acid solutions are used, fiber ropes are not permitted unless acid-proof.

12) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent them from swaying. Window cleaners' anchors shall not be used for this purpose.

13) The platform of every two-point suspension scaffold shall be one of the following types:

12.1. The side stringer of ladder-type platforms shall be clear straight-grained spruce or materials of equivalent strength and durability. The rungs shall be of straight-grained oak, ash, or hickory, at least 1 1/8 inch in diameter, with seven-eighth inch tenons mortised into the side stringers at least seven-eighth inch. The stringers shall be tied together with the tie rods not less than one-quarter inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than five-eighth inch apart except at the side rails where the space may be 1 inch. Ladder-type platforms shall be constructed in accordance with table D-17.

12.2. Plank-type platforms shall be composed of not less than nominal 2×8-inch unspliced planks, properly cleated together on the underside starting 6 inches from each end; intervals in between shall not exceed 4 feet. The plank-type platform shall not extend beyond the hangers more than 18 inches. A bar or

other effective means shall be securely fastened to the platform at each end to prevent its slipping off the hanger. The span between hangers for plank-type platforms shall not exceed 10 feet.

12.3. Beam platforms shall have side stringers of lumber not less than 2×6 inches set on edge. The span between hangers shall not exceed 12 feet when beam platforms are used. The flooring shall be supported on 2- and 6-inch crossbeams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than 4 feet, securely nailed in place. The flooring shall be of 1×6inch material properly nailed. Floorboards shall not be spaced more than one-half inch apart.

Table D-17 – Schedule for Ladder Type Platforms					
	Length of platform (feet)				
	12	14 & 16	18 & 20	22 & 24	28 & 30
Side stringers, minimum cross section (finished sizes):					
At ends (inches)	1-3/4 x 2-3/4	1-3/4 x 2-3/4	1-3/4 x 3	1-3/4 x 3	1-3/4 x 3-1/2
At middle (inches)	1-3/4 x 3-3/4	1-3/4 x 3-3/4	1-1/4 x 4	1-3/4 x 4-1/4	1-3/4 x 5
Reinforcing strip (minimum)	1	1	1	1	1
Rungs	2	2	2	2	2
Tie rods:					
Number (minimum)	3	4	4	5	6
Diameter (minimum)	¼”	¼”	¼”	¼”	¼”
Flooring, minimum finished size (inches)	½ x 2-3/4	½ x 2-3/4	½ x 2-3/4	½ x 2-3/4	½ x 2-3/4
Footnote (1) A 1/8” x 7/8”, steel reinforcing strip or its equivalent shall be attached to the side or the underside full length. Footnote (2) Rungs shall be 1-1/8” minimum, diameter with at least 7/8” diameter tenons, and the maximum spacing shall be 12” center to center.					

Stone setters' adjustable multiple-point suspension scaffolds [1]

1) The scaffold shall be capable of sustaining a working load of 25 pounds per square foot and shall not be overloaded. Scaffolds shall not be used for storage of stone or other heavy materials.

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2) The hoisting machine and its supports shall be of a type tested and listed by a nationally recognized testing laboratory. Refer to §1910.399(a)(77) for definition of listed, and §1910.7 for nationally recognized testing laboratory.
3) The platform shall be securely fastened to the hangers by U-bolts or other equivalent means.

4) The scaffold unit shall be suspended from metal outriggers, iron brackets, wire rope slings, or iron hooks which will safely support the maximum intended load.

5) Outriggers when used shall be set with their webs in a vertical position, securely anchored to the building or structure and provided with stop bolts at each end.

6) The scaffold shall be supported by wire rope conforming with Subpart L CFR 1926 OSHA Standards for the Construction Industry.

7) The free ends of the suspension wire ropes shall be equipped with proper size thimbles, secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of rope shall remain on the drum at all times.

8) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

9) When two or more scaffolds are used on a building or structure they shall not be bridged one to the other but shall be maintained at even height with platforms butting closely.

10) Each scaffold shall be installed or relocated in accordance with designs and instructions of a registered professional engineer, and such installation or relocation shall be supervised by a competent designated person.

Single-point adjustable suspension scaffolds [1]

1) The scaffolding, including power units or manually operated winches, shall be a type tested and listed by a nationally recognized testing laboratory. Refer to §1910.399(a)(77) for definition of listed, and §1910.7 for nationally recognized testing laboratory.

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2) All power-operated gears and brakes shall be enclosed.

3) In addition to the normal operating brake, all-power driven units must have an emergency brake which engages automatically when the normal speed of descent is exceeded.

4) Guards, mid-rails, and toeboards shall completely enclose the cage or basket. Guardrails shall be no less than 2 by 4 inches or the equivalent installed no less than 36 inches nor more than 42 inches above the platform. Mid-rails shall be 1 by 6 inches or the equivalent, installed equidistant between the guardrail and the platform. Toeboards shall be a minimum of 4 inches in height.

5) The hoisting machines, cables, and equipment shall be regularly serviced and inspected after each installation and every 30 days thereafter.

6) The units may be combined to form a two-point suspension scaffold.

7) The supporting cable shall be straight for its entire length, and the operator shall not sway the basket and fix the cable to any intermediate points to change his original path of travel.

8) Equipment shall be maintained and used in accordance with the manufacturers' instructions.

Boatswain's chairs [1]

1) The chair seat shall be not less than 12 by 24 inches, and of 1-inch thickness. The seat shall be reinforced on the underside to prevent the board from splitting.

2) The two fiber rope seat slings shall be of 5/8-inch diameter, reeved through the four seat holes so as to cross each other on the underside of the seat.

3) Seat slings shall be of at least 3/8-inch wire rope when a workman is conducting a heat producing process such as gas or arc welding.

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4) The workman shall be protected by a full body harness attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the worker in case of a fall.

5) The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced 5/8-inch diameter first-grade manila rope.

6) The roof irons, hooks, or the object to which the tackle is anchored shall be securely installed. Tiebacks when used shall be installed at right angles to the face of the building and securely fastened to a chimney.

Carpenters' bracket scaffolds [1]

1) The brackets shall consist of a triangular wood frame not less than 2 by 3 inches in cross section, or of metal of equivalent strength. Each member shall be properly fitted and securely joined.

2) Each bracket shall be attached to the structure by means of one of the following:

    2.1. A bolt no less than five-eighths inch in diameter which shall extend through the inside of the building wall.
    2.2. A metal stud attachment device.
    2.3. Welding to steel tanks.
    2.4. Hooking over a well-secured and adequately strong supporting member.

3) The brackets shall be spaced no more than 10 feet apart.

4) No more than two persons shall occupy any given 10 feet of a bracket scaffold at any one time. Tools and materials shall not exceed 75 pounds in addition to the occupancy.

5) The platform shall consist of not less than two 2- by 9-inch nominal size planks extending not more than 18 inches or less than 6 inches beyond each end support.

6) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

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Bricklayers' square scaffolds [1]

1) The squares shall not exceed 5 feet in width and 5 feet in height.

2) Members shall be not less than those specified in Table D-18.

3) The squares shall be reinforced on both sides of each corner with 1- by 6-inch gusset pieces. They shall also have braces 1 by 8 inches on both sides running from center to center of each member, or other means to secure equivalent strength and rigidity.

4) The squares shall be set not more than 5 feet apart for medium duty scaffolds, and not more than 8 feet apart for light duty scaffolds. Bracing 1×8 inches, extending from the bottom of each square to the top of the next square, shall be provided on both front and rear sides of the scaffold.

Table D-18 – Minimum Dimensions for Bricklayers' Square Scaffold Members	
Members	Dimensions (Inches)
Bearers or horizontal members	2 x 6
Legs	2 x 6
Braces at corners	1 x 6
Braces diagonally from center frame	1 x 8

5) Platform planks shall be at least 2- by 9-inch nominal size. The ends of the planks shall overlap the bearers of the squares and each plank shall be supported by not less than three squares.

6) Bricklayers' square scaffolds shall not exceed three tiers in height and shall be so constructed and arranged that one square shall rest directly above the other. The upper tiers shall stand on a continuous row of planks laid across the next lower tier and be nailed down or otherwise secured to prevent displacement.

7) Scaffolds shall be level and set upon a firm foundation.

Horse scaffolds

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1) Horse scaffolds shall not be constructed or arranged more than two tiers.

2) The members of the horses shall be not less than those specified in Table D-19.

3) Horses shall be spaced not more than 5 feet.

4) When arranged in tiers, each horse shall be placed directly over the horse in the tier below.

5) On all scaffolds arranged in tiers, the legs shall be nailed down to the planks to prevent displacement or thrust and each tier shall be substantially cross braced.

Table D-19 – Minimum Dimensions for Horse Scaffold Members	
Members	Dimensions (Inches)
Horizontal members or bearers	3 x 4
Legs	1-1/4 x 4-1/2
Longitudinal brace between legs	1 x 6
Gusset brace at top of legs	1 x 8
Half diagonal braces	1-1/4 x 4-1/2

6) Horses or parts which have become weak or defective shall not be used.

7) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high with a mid-rail, when required, of 1- by 4-inch lumber or equivalent and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

Needle beam scaffold

1) Wood needle beams shall be in accordance with paragraph (a) (5) and (9) of this section, and shall be not less than 4 by 6 inches in size, with the greater dimension placed in a vertical direction. OSHA Standards for the Construction Industry Subpart L CFR1926.

2) Ropes or hangers shall be provided for supports. The span between supports on the needle beam shall not exceed 10 feet for 4- by 6-inch timbers. Rope supports shall be equivalent in strength to 1-inch diameter first-grade manila rope.

3) The ropes shall be attached to the needle beams by a scaffold hitch or a properly made eye splice. The loose end of the rope shall be tied by a bowline knot or by a round turn and one-half hitch.

4) The platform span between the needle beams shall not exceed 8 feet when using 2-inch scaffold plank. For spans greater than 8 feet, platforms shall be designed based on design requirements for the special span. The overhang of each end of the platform planks shall be not less than 1 foot and not more than 18 inches.

5) When one needle beam is higher than the other or when the platform is not level the platform shall be secured against slipping.

6) All unattached tools, bolts, and nuts used on needle beam scaffolds shall be kept in suitable containers.

7) One end of a needle beam scaffold may be supported by a permanent structural member.

8) Each man working on a needle beam scaffold 20 feet or more above the ground or floor and working with both hands, shall be protected by a full body harness attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall.

Plasterers', decorators', and large area scaffolds

1) Plasterers', decorators', lathers', and ceiling workers' inside scaffolds shall be constructed in accordance with the general requirements set forth for independent wood pole scaffolds.

2) Guardrails not less than 2 by 4 inches or the equivalent and not less than 38 inches or more than 45 inches high, with a mid-rail, when required, of 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

3) All platform planks shall be laid with the edges close together.

4) When independent pole scaffold platforms are erected in sections, such sections shall be provided with connecting runways equipped with substantial guardrails.

Interior hung scaffolds

1) For hanging wood scaffolds, the following minimum nominal size material is recommended:

    2.1. Supporting bearers 2 by 9 inches on edge.
    2.2. Planking 2 by 9 inches or 2 by 10 inches, with maximum span 7 feet for heavy duty and 10 feet for light duty or medium duty.

2) Steel tube and coupler members may be used for hanging scaffolds with both types of scaffold designed to sustain a uniform distributed working load up to heavy duty scaffold loads with a safety factor of four.

3) When a hanging scaffold is supported by means of wire rope, such wire rope shall be wrapped at least twice around the supporting members and twice around the bearers of the scaffold, with each end of the wire rope secured by at least three standard wire-rope clips.

4) All overhead supporting members shall be inspected and checked for strength before the scaffold is erected.

5) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height.

Ladder-jack scaffolds

1) All ladder-jack scaffolds shall be limited to light duty and shall not exceed a height of 20 feet above the floor or ground.

2) Any person working on a ladder jack scaffold shall be protected from falls with a full body harness and lifeline or if possible by guardrail system.

3) All ladders used in connection with ladder-jack scaffolds shall be heavy-duty ladders and shall be designed and constructed in accordance with §1910.25 and §1910.26.

4) The ladder jack shall be so designed and constructed that it will bear on the side rails in addition to the ladder rungs, or if bearing on rungs only, the bearing area shall be at least 10 inches on each rung.

5) Ladders used in conjunction with ladder jacks shall be so placed, fastened, held, or equipped with devices so as to prevent slipping.

6) The wood platform planks shall be not less than 2 inches nominal in thickness. Both metal and wood platform planks shall overlap the bearing surface not less than 12 inches. The span between supports for wood shall not exceed 8 feet. Platform width shall be not less than 18 inches.

7) Not more than two persons shall occupy any given 8 feet of any ladder-jack scaffold at any one time.

Window-jack scaffolds

1) Window-jack scaffolds shall be used only for the purpose of working at the window opening through which the jack is placed.

2) Window jacks shall not be used to support planks placed between one window jack and another or for other elements of scaffolding.

3) Window-jack scaffolds shall be provided with suitable guardrails unless safety belts with lifelines are attached and provided for the workman. Window-jack scaffolds shall be used by one man only.

Roofing brackets

1) Roofing brackets shall be constructed to fit the pitch of the roof.

2) Brackets shall be secured in place by nailing in addition to the pointed metal projections. The nails shall be driven full length into the roof. When rope supports are used, they shall consist of first-grade manila of at least three-quarter-inch diameter, or equivalent.

3) A substantial catch platform shall be installed below the working area of roofs more than 20 feet from the ground to eaves with a slope greater than 3 inches in 12 inches without a parapet. In width the platform shall extend 2 feet beyond the projection of the eaves and shall be provided with a safety rail, mid-rail, and toeboard. This provision shall not apply where employees engaged in work upon such roofs are protected by a full body harness attached to a lifeline.

4) All persons working on a roof shall be protected from falls with a full body harness and lifeline.

Crawling boards or chicken ladders

1) Crawling boards shall be not less than 10 inches wide and 1 inch thick, having cleats 1×1 1/2 inches. The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed 24 inches. Nails shall be driven through and clinched on the underside. The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

2) A firmly fastened lifeline of at least three-quarter-inch rope shall be strung beside each crawling board for a handhold.

3) Crawling boards shall be secured to the roof by means of adequate ridge hooks or equivalent effective means.

4) All persons working on a roof shall be protected from falls with a full body harness and lifeline.

[1] OSHA Standards for the Construction Industry

DOSTER
CONSTRUCTION COMPANY

Daily Scaffold Checklist/Inspection

Job Name:_____ Competent Person Signature: _____Date _____
Job Location:_____ Company:_____

The inspection needs to be completed by the designated competent person on a daily basis.

	YES	NO	N/A	ACTION/COMMENT
1. Are sills properly placed and adequate size?				
2. Have screw jacks been used to level and plumb scaffold instead of unstable objects such as concrete blocks, loose bricks, etc.?				
3. Is scaffold level and plumb?				
4. Are all scaffold legs braced with braces properly attached?				
5. Is guard railing in place on all open sides and ends above 6'?				
6. Do all components (cross bracing, frames, etc.) fit properly?				
7. Has proper access to working levels been provided?				
8. Has overhead protection, toe boards, or wire screening been provided?				
9. Are toe boards installed properly?				
10. Has scaffold been tied to structure at least every 30' in length and 20' in height?				
11. Are working levels platforms fully planked between guard rails?				
12. Do planks have minimum 12" overlap and extend 6" beyond support?				
13. Have all planks been inspected?				
14. Have any planks been found that are warped, damaged, or otherwise unsafe? Have they been removed and replaced by planks that do meet loading requirements?				
15. Have hazardous conditions been provided for: Power lines? Wind Loading? Possible washout of footings? Uplift an overturning moments due to placement of brackets, putlogs or other causes?				
16. Is scaffold free of makeshift devices or ladders to increase height?				
17. Have personnel been instructed in the safe use of the scaffold?				

This form has to be turned in with Subcontractor Daily Report to Doster Construction Company Inc.'s Jobsite Superintendent

Date:_____ Signature:_____
Competent Person

Section 27
Aerial and Scissors Lifts

Scope

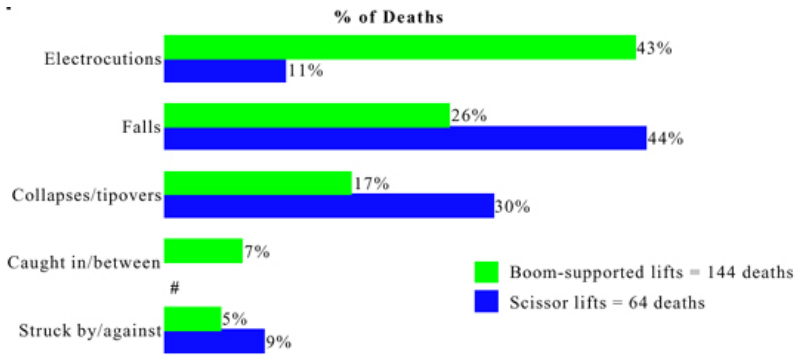
Aerial and scissors lifts are frequently used to perform work in areas that cannot be accessed from the ground or from solid construction. When working with any lift, an awareness of all hazards is a must. Each year, workers die or are seriously injured when using man-lifts. More than half of the deaths involve boom-supported lifts, such as bucket trucks and cherry pickers. Most of the other deaths involve scissor lifts. This section will help employees when working around and with an aerial or scissors lift by setting some requirements when inspecting, maintaining and using such lifts.

Aerial and Scissors Lift Facts

- 2-3% of deaths in construction are aerial or scissors lift related.

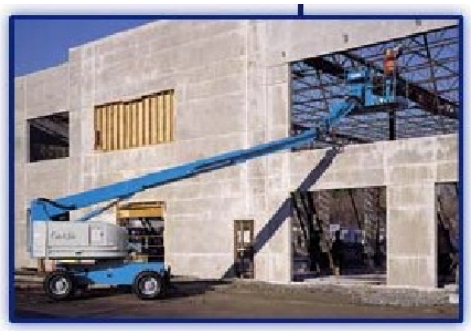
- In construction there are about 6 deaths per year due to scissor lifts, over a third of them due to falls. Many scissor lift manufacturers recommend tying off, but only to an approved anchor on the scissors lift.

Causes of Death from Aerial Lifts in Construction



Data for scissor lifts does not meet Bureau of Labor Statistics publication criteria. [Source: U.S. Bureau of Labor Statistics data]

Renting an Aerial Lift



1) Get maintenance history of aerial lift

2) Get operator's manual and maintenance manual (if separate)

3) Ensure a detailed maintenance check is done before rental acceptance

4) Make sure operator controls are easily accessible and properly marked

5) Make sure aerial lift is equipped with a proper / workable fire extingusher

Operator Training

1) Training must be done by a qualified person experienced with the particular lift model
2) Training must include:
   - 2.1. Nature of electrical, fall, and other hazards involved in operating lift
   - 2.2. Precautions for dealing with hazards
   - 2.3. Rated load capacity for the lift (including workers, tools, materials, bucket liner, etc.)
   - 2.4. Manufacturer requirements, as outlined in operator manual
   - 2.5. Demonstration of skill and knowledge in actual operation of the aerial lift

Maintenance Requirements

1) Training of mechanics should be done by qualified person experienced with lift model

2) Maintenance should include:

   - 2.1. Knowledge of manufacturer's maintenance requirements
   - 2.2. Frequent inspections of aerial lift by qualified mechanic
   - 2.3. At least annual detailed inspections by qualified mechanic

3) Insulated aerial lifts have special electrical test requirements

4) De-energize and lockout/tagout aerial lift before conducting maintenance and repairs

Before Operating Aerial Lifts

1) Never modify aerial lift without written permission from the manufacturer

2) Check safety devices, operating controls before each use

3) Check area in which aerial lift will be used for:

   3.1. Level surface (Do not exceed manufacturer slope recommendations)
   3.2. Holes, drop-offs, bumps, debris, etc.
   3.3. Overhead obstructions and overhead power lines
   3.4. Stable surface
   3.5. Other hazards

4) Set outriggers, brakes, wheel chocks

Preventing Electrocutions

1) Non-electrical workers must stay at least 10 feet away from overhead power lines.

2) Electrical workers must de-energize/insulate power lines or use proper PPE/equipment.
3) Use insulated buckets near overhead power lines

4) Regularly check insulation on buckets

Preventing Tip-Overs

1) Do not exceed manufacturer rated load capacity limits

2) Do not travel to job location with lift in elevated position.

3) Set up proper work zone protection when working near traffic

4) Positioning of lifts

4.1. Do not drive near drop-offs or holes.
4.2. Do not raise platform on uneven or soft surfaces.
4.3. Do not drive onto uneven or soft surfaces when elevated.
4.4. Do not raise platform on slope or drive onto slope when elevated.
4.5. Do not raise platform in windy or gusty conditions.

5) Avoid excessive horizontal forces when working on elevated scissor lifts

Fall Protection Policy for Aerial Lifts and Scissor Lifts

1) Aerial Lifts (not including scissors lift)
   - Personal fall arrest system is required (full body harness with lanyard) at all times the operator is in the lift.
   - It is highly recommended that operators do not exit the lift while working overhead.
   - Never connect fall arrest systems to rails of aerial or scissor lifts. Personal fall arrest system shall be connected to the lift manufacturer's designated tie off point.
   - Possible risk of tipping over some boom lifts and scissor lifts exists due to fall stopping force.
   - Always close entrance chains on doors.
   - Stand on floor of bucket of lift platform.
2) Scissors Lift
   - Safety chain has to be latched once operator is inside lift.
   - Personal fall protection equipment is required once platform of scissor lift is extended.
   - Once the operators' feet are not on the scissor lift platform, a personal fall arrest system is required.
   - Never connect fall arrest systems to rails of aerial or scissor lifts. Personal fall arrest system shall be connected to the lift manufacturer's designated tie off point.
   - Possible risk of tipping over some boom lifts and scissor lifts exists due to fall stopping force.
3) Personnel cannot attach lanyards to adjacent structures or equipment while they are working form aerial or scissors lift.
4) Inspection of aerial and scissor lift equipment shall be done on a daily basis and / or each shift.

[Reference: Center to Protect Worker's Rights – www.cprw.com]

DOSTER CONSTRUCTION COMPANY	**Daily Aerial Lift Inspection**	Lift Type:_____ Lift Model No.:_____

Contractor Name :_____ **Inspectors Name:_____**

Operator's Card Verified: ☐ **Y** ☐ **N** ✓ **For Pass** **X For Fail**

Date	/	/	/	/	/	/	/
1. Operating and emergency controls are in proper working condition……							
2. Upper drive controls interlock mechanism is functional (dead man switch)……..							
3. Emergency lowering mechanism operates properly…….							
4. Lower operating controls override upper controls……..							
5. Upper and lower controls are adequately protected from inadvertent operation……							
6. Control panel is clean and all buttons and switches are clearly visible……...							
7. All switch and mechanical guards are installed and in good condition……...							
8. All safety indicator lights are operating properly…….							
9. Drive controls are properly labeled and functioning……							
10. Motion alarms are functional and clearly audible……...							
11. All safety decals are in place and clearly readable…….							
12. All guardrails are sound and in place, including safety chains…….							
13. Work platform and extension slides are clean from debri and trash……..							
14. Work platform extension slides freely and locking mechanism is in place and functional...							
15. Any defects (cracked welds, fuel or hydraulic leaks, damaged cables/wires) present							
16. Tires and wheels in good functional condition (air pressure)……							
17. Are all breaking devices operating properly…….							
18. Manufacturer's operators manual present on the lift and in good condition…….							
19. Hazardous energy in vicinity (electrical lines overhead, utilities, drain lines, etc)……							
20. Surface conditions (drop offs, holes, uneven surfaces, etc.)……							

Comments :

_____

_____

_____

Doster Representative Initials:_____

Form to be completed daily and kept with the equipment at all times. At the end of the week turn in to project Superintendent.

Section 28
Powered Industrial Trucks

The OSHA standard for powered industrial truck training [29 CFR 1910.178(l)] requires that an employer provide training to truck operators on a variety of topics. Among these topics are vehicle inspection and maintenance that the operator will be required to perform. The following checklists are being provided as part of OSHA's ongoing effort to assist employers and employees in ensuring that a safe and healthful workplace is provided. The lists serve as a guide only and may not be totally inclusive. Each type of powered industrial truck is unique and checklists pertinent to each type of vehicle should be modified accordingly. It is recommended that the manufacturer's instructions on vehicle maintenance and owner's and operator's responsibilities also be consulted. The OSHA standards for powered industrial trucks must be reviewed to ensure compliance.

There are two general types of powered industrial trucks: electric (battery) powered and internal combustion engine (gas/LPG/diesel) powered. Each of these general types has a variety of different configurations and attachments. Your workplace may have a variety of trucks that are being operated. ALL OPERATORS MUST BE TRAINED TO OPERATE ALL TYPE OF INDUSTRIAL TRUCKS THEY WILL BE OPERATING.

Daily, pre-shift inspection of powered industrial trucks is required by OSHA standards.

Depicted below are the major types of industrial trucks and some of the most common variations. The drawings of the trucks depicted below are intended to represent the typical configuration of trucks for each type. They do not include all available options, attachments or configurations.

Daily checklists for each type of industrial truck are available from the truck manufacturer. You may choose to use a checklist for each type of industrial truck in your workplace or compile one that can be used for any type of truck.

Refer to the owner's manual, specifications and manufacturer's recommendations to modify the checklist for trucks being operated in your workplace. Below are sample checklists for internal combustion and electric trucks. These lists can be modified to suit your workplace needs.

Operator's Daily Checklist - Internal Combustion Engine Industrial Truck - Gas/LPG/Diesel Truck

Record of Fuel Added

Date		Operator		Fuel	
Truck#		Model#		Engine Oil	
Department		Serial#		Radiator Coolant	
Shift		Hour Meter		Hydraulic Oil	

SAFETY AND OPERATIONAL CHECKS (PRIOR TO EACH SHIFT)

Have a **qualified** mechanic correct all problems.

Engine Off Checks	OK	Maintenance
Leaks – Fuel, Hydraulic Oil, Engine Oil or Radiator Coolant		
Tires – Condition and Pressure		
Forks, Top Clip Retaining Pin and Heel – Check Condition		
Load Backrest – Securely Attached		
Hydraulic Hoses, Mast Chains, Cables and Stops – Check Visually		
Overhead Guard – Attached		
Finger Guards – Attached		
Propane Tank (LP Gas Truck) – Rust Corrosion, Damage		
Safety Warnings – Attached (Refer to Parts Manual for Location)		
Battery – Check Water/Electrolyte Level and Charge		
All Engine Belts – Check Visually		
Hydraulic Fluid Level – Check Level		
Engine Oil Level – Dipstick		
Transmission Fluid Level – Dipstick		
Engine Air Cleaner – Squeeze Rubber Dirt Trap or Check the Restriction Alarm (if equipped)		
Fuel Sedimentor (Diesel)		
Radiator Coolant – Check Level		
Operator's Manual – In Container		
Nameplate – Attached and Information Matches Model, Serial Number and Attachments		
Seat Belt – Functioning Smoothly		
Hood Latch – Adjusted and Securely Fastened		
Brake Fluid – Check Level		

Engine On Checks – Unusual Noises Must Be Investigated Immediately	OK	Maintenance
Accelerator or Direction Control Pedal – Functioning Smoothly		
Service Brake – Functioning Smoothly		
Parking Brake – Functioning Smoothly		
Steering Operation – Functioning Smoothly		
Drive Control – Forward/Reverse – Functioning Smoothly		
Tilt Control – Forward and Back – Functioning Smoothly		
Hoist and Lowering Control – Functioning Smoothly		
Attachment Control – Operation		
Horn and Lights – Functioning		
Cab (if equipped) – Heater, Defroster, Wipers – Functioning		
Gauges: Ammeter, Engine Oil Pressure, Hour Meter, Fuel Level, Temperature, Instrument Monitors – Functioning		

Section 29
Crane Safety

Purpose

Many types of cranes, hoists, and rigging devices may be used at Doster Construction Company, Inc. for lifting and moving materials. Doster's policy is to maintain a safe workplace for its employees; therefore, it cannot be overemphasized that **only certified individuals shall operate these devices.** The safety rules and guidance in this chapter apply to all operations at Doster that involve the use of cranes installed in or attached to buildings and to all our employees, supplemental labor, and subcontractor personnel who use such devices.

Responsibilities

Supervisors are responsible for:

1) Ensuring that employees under their supervision receive the required training and are certified and licensed to operate the cranes in their areas.

2) Ensure that training for operators is conducted by an independent testing agency approved by the National Commission for Certifying Agencies (NCCA) and recognized by the National Commission for the Certification of Crane Operators (NCCCO).

3) Ensure that all crane and rigging equipment is of an approved type for the task and it is used in an approved manner.

4) Ensuring that hoisting equipment is inspected and tested monthly by a responsible individual and that rigging equipment is inspected daily. Any lifting equipment showing signs of wear and/or damage shall be taken out of service immediately.

5) Obtain and file copies of crane and crane operator certifications.

Crane Operators are responsible for:

1) Operating hoisting equipment safely.

2) Conducting functional tests prior to using the equipment. Perform a Daily Crane Pre-Operational Inspection and document on appropriate form, provide copies to Site Superintendent.

3) Maintaining written records of additional inspections and tests, and providing copies of all these inspections and test results to Site Superintendent.

4) Selecting and using rigging equipment appropriately.

5) Maintaining all manuals for cranes in a central file for reference.

6) A load chart for the specific type crane is kept in the cab and available for use.

7) Having a valid/current operator's license on their person while operating cranes or hoists.

8) Participating in the medical certification program, as required.

Safety Department is responsible for

1) Periodically verifying monthly test and inspection reports.

2) Interpreting crane and hoist safety rules and standards.

Safe Operating Requirements

All workers who use a crane shall have a certified operator's license.

Crane and Hoist Safety Design Requirements

Following are the design requirements for cranes and their components:

1) The design of all commercial cranes shall comply with the requirements of ANSI/ASME B30 standards and Crane Manufacturer's Association of America standards (CMAA-70 and CMAA-74).

2) All crane and hoist hooks shall have safety latches.

3) Hooks shall not be painted (or re-painted) if the paint previously applied by the manufacturer is worn.

4) Crane pendants shall have an electrical disconnect switch or button to open the main-line control circuit.

5) Cranes shall have a main electrical disconnect switch. This switch shall be in a separate box that is labeled with lockout capability.

6) Each hoist-hook block shall be labeled with the maximum hook capacity.

7) **Anti Two-Block Device:** A device such as an upper-limit switch or slip clutch shall be installed on all building cranes. A lower-limit switch may be required when there is insufficient hoist rope on the drum to reach the lowest point.

Anti-two Block Device shown.

8) All cranes shall have a motion alarm to signal crane movement.

9) All newly installed cranes, or those that have been extensively repaired or rebuilt structurally, shall be load tested at 125% capacity prior to being placed into service. Tower cranes shall receive a certification inspection once erected on a Doster Construction Company jobsite, no matter how long it has been since the last certification.

10) If an overload device is installed, a load test to the adjusted setting is required.

11) Personnel baskets and platforms suspended from any crane shall be designed in accordance with the specifications in 29 CFR 1926.550(g).

12) All windows in cabs must be safety glass that produces no visible distortion that will interfere with the safe operation of the machine.

13) Mobile cranes must be equipped with a 5BC fire extinguisher as a minimum.

General Safety Rules

Operators shall comply with the following rules while operating the cranes:

1) Do not engage in any practice that will divert your attention while operating the crane.

2) Respond to signals only from the person who is directing the lift, or any appointed signal person. Obey a stop signal at all times, no matter who gives it.

3) **Do not move a load over people.** People shall not be placed in jeopardy by being under a suspended load. Also, do not work under a suspended load unless the load is supported by blocks, jacks, or a solid footing that will safely support the entire weight. Have a crane operator remain at the controls or lock open and tag the main electrical disconnect switch.

4) Ensure that the rated load capacity of a crane, any sling or fitting is not exceeded. Know the weight of the object being lifted or use a dynamometer or load cell to determine the weight.

5) Check that all controls are in the OFF position before closing the main-line disconnect switch.

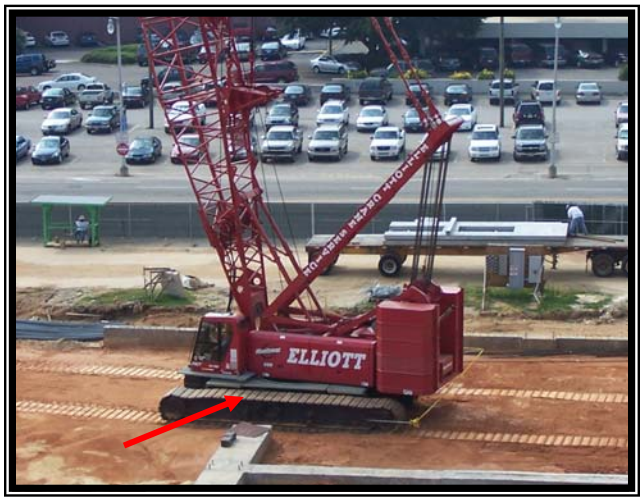
6) If spring-loaded reels are provided to lift pendants clear off the work area, ease the pendant up into the stop to prevent damaging the wire.

7) **Avoid side pulls.** These can cause the load line to slip out of the drum groove, damaging the rope or destabilizing the crane or hoist.

8) To prevent shock loading, avoid sudden stops or starts. Shock loading can occur when a suspended load is accelerated or decelerated, and can overload the crane or hoist. When completing an upward or downward motion, ease the load slowly to a stop.

9) The swing radius of a crane must be properly barricaded at all times while working at the site.

10) Cranes, hoists, boom trucks and derricks shall not be installed or operated within 10' of overhead power lines unless they have been de-energized. **Refer to Section 14 Electrical Safety.**



This crane is not properly barricaded.

Operation Rules

Pre-operational Test

At the start of each work shift, operators shall do the following steps before making lifts with any crane:

1) Test the upper-limit switch. Slowly raise the unloaded hook block until the limit switch trips.

2) Visually inspect the hook, load lines, boom, jib, and lattices as much as possible from the operator's station; in most instances, this will be the floor of the building.

3) If provided, test the lower-limit switch.

4) Test all direction and speed controls.

5) Test the emergency stop.

6) Test the load line brake to verify there is no drift without a load.

7) Test motion alarm.

8) Lock out and tag for repair any crane or hoist that fails any of the above tests.

9) Document pre-operational test on the Daily Pre-Operational Inspection sheet. Attachment A.

Moving a Load

1) Center the hook over the load to keep the cables from slipping out of the drum grooves and overlapping, and to prevent the load from swinging when it is lifted. Inspect the drum to verify that the cable is in the grooves.

2) Use a tag line when loads must traverse long distances or must otherwise be controlled. Manila rope may be used for tag lines.

3) Plan and check the travel path to avoid personnel and obstructions.

4) Lift the load only high enough to clear the tallest obstruction in the travel path.

5) Start and stop slowly.

6) Land the load when the move is finished. Choose a safe landing.

7) ***Never* leave suspended loads unattended.** In an emergency where the crane has become inoperative, if a load must be left suspended, barricade and post signs in the surrounding area, under the load, and on all four sides. Lock open and tag the crane or hoist's main electrical disconnect switch.

8) Mobile crane movement on site must be in accordance with manufacturer's recommendations.

Parking a Crane or Hoist

1) Remove all slings and accessories from the hook. Return the rigging device to the designated storage racks.

2) Raise the hook at least 2.1 m (7 ft) above the floor.

3) Place the emergency stop switch (or push button) in the OFF position.

Rigging

General Rigging Safety Requirements

Only select rigging equipment that is in good condition. A qualified rigger must inspect the rigging to be used prior to each shift. Defective equipment is to be removed from service and destroyed to prevent inadvertent reuse. **The load capacity limits shall always be stamped or affixed to all rigging components.**

The following types of slings shall be rejected or destroyed:

1) Nylon slings with

   1.1. Abnormal wear.
   1.2. Torn stitching.
   1.3. Broken or cut fibers.
   1.4. Discoloration or deterioration.

2) Wire-rope slings with

   2.1. Kinking, crushing, bird-caging, or other distortions.
   2.2. Evidence of heat damage.
   2.3. Cracks, deformation, or worn end attachments.
   2.4. Six randomly broken wires in a single rope lay.
   2.5. Three broken wires in one strand of rope.
   2.6. Hooks opened more than 15% at the throat.
   2.7. Hooks twisted sideways more than 10deg. from the plane of the unbent hook.

3) Alloy steel chain slings with

   3.1. Cracked, bent, or elongated links or components.
   3.2. Cracked hooks.

4) Shackles, eye bolts, turnbuckles, or other components that are damaged or deformed.

Rigging the Load

Do the following when rigging a load:

1) Determine the weight of the load. **Never guess.**

2) Determine the proper size for slings and components.

3) **Do not use manila rope for rigging.**

4) Make sure that shackle pins and shouldered eye bolts are installed in accordance with the manufacturer's recommendations.

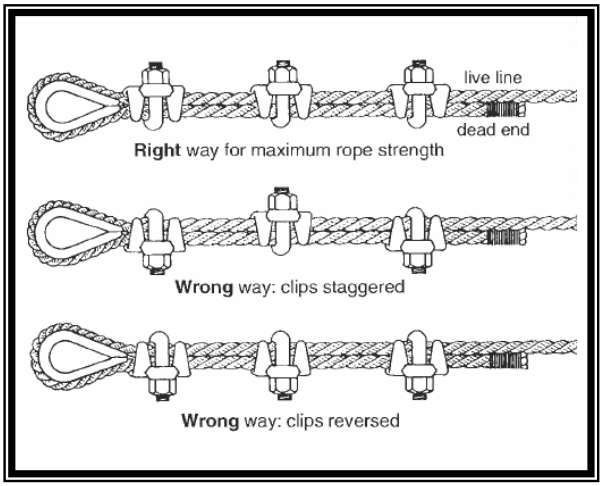
5) Make sure that ordinary (shoulderless) eye bolts are threaded in at least 1.5 times the bolt diameter.

6) Use safety hoist rings (swivel eyes) as a preferred substitute for eye bolts wherever possible.

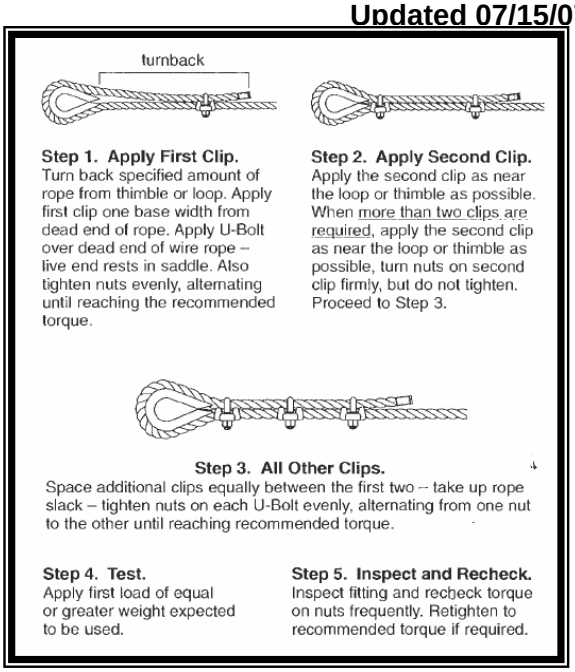
7) **Pad sharp edges to protect slings.** Remember that machinery foundations or angle-iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load. Wood, tire rubber, or other pliable materials may be suitable for padding.

8) Do not use slings, eye bolts, shackles, or hooks that have been cut, welded, or brazed.

9) Install wire-rope clips with the base only on the live end and the U-bolt only on the dead end. Follow the manufacturer's recommendations for the spacing for each specific wire size.



Never saddle a dead horse!



10) Determine the center of gravity and balance the load before moving it.

11) Initially lift the load only a few inches to test the rigging and balance.

12) Always use a tag line when working with suspended loads.

Crane Overloading

Cranes shall not be loaded beyond their rated capacity for normal operations. Any crane suspected of having been overloaded shall be removed from service by locking open and tagging the main disconnect switch. Additionally, overloaded cranes shall be inspected, repaired, load tested, and approved for use before being returned to service.

Working at Heights on Cranes or Hoists

Anyone conducting maintenance or repair on cranes at heights greater than 6 ft shall use fall protection. Fall protection includes safety harnesses that are fitted with a lifeline and securely attached to a structural member of the crane or building or properly secured safety nets.

Use of a crane as a work platform should only be considered when conventional means of reaching an elevated worksite are hazardous or not possible.

Hand Signals

Signals to the operator shall be in accordance with the standard hand signals unless voice communications equipment (telephone, radio, or equivalent) is used. Signals shall be discernible or audible at all times. Some special operations may require addition to or modification of the basic signals. For all such cases, these special signals shall be agreed upon and thoroughly understood by both the person giving the signals and the operator, and shall not be in conflict with the standard signals. **Refer to Attachment B – Crane Signals at the end of this section.**

Inspection, Maintenance, and Testing

All tests and inspections shall be conducted in accordance with the manufacturers recommendations.

Monthly Tests and Inspections

1) All in-service cranes shall be inspected monthly.

2) Defective cranes shall be locked and tagged "out of service" until all defects are corrected. The inspector shall initiate corrective action by notifying the Site Superintendent.

Annual Inspections

Perform annual preventive maintenance (PM) and annual inspections of all cranes.

The annual PM and inspection shall cover (and it is not limited to):

1) Hoisting and lowering mechanisms.

2) Crane travel and/or rotation.

3) Limit switches and locking and safety devices.

4) Structural members.

5) Bolts or rivets.

6) Sheaves and drums.

7) Parts such as pins, bearings, shafts, gears, rollers, locking devices, and clamping devices.

8) Brake system parts, linings, pawls, and ratchets.

9) Load, wind, and other indicators over their full range.

10) Gasoline, diesel, electric, or other power plants.

11) Chain-drive sprockets.

12) Crane and hoist hooks.

13) Electrical apparatus such as controller contractors, limit switches, and push button stations.

14) Wire rope.

15) Hoist chains.

Load Testing

1) Newly installed cranes shall be load tested at 125% of the rated capacity by designated personnel.

2) Slings shall have appropriate test data when purchased. It is the responsibility of the purchaser to ensure that the appropriate test data are obtained and maintained.

3) Re-rated cranes shall be load tested to 125% of the new capacity if the new rating is greater than the previous rated capacity.

4) Fixed cranes that have had major modifications or repair shall be load tested to 125% of the rated capacity.

5) Cranes that have been overloaded shall be inspected prior to being returned to service.

6) Personnel platforms, baskets, and rigging suspended from a crane hook shall be load tested initially, then re-tested annually thereafter or at each new job site.

7) All cranes with a capacity greater than 2722 kg (3 tons) should be load tested every four years to 125% of the rated capacity. Cranes with a lesser capacity should be load tested every eight years to 125% of the rated capacity.

Critical Lifts

Any lift exceeding 75% of the crane's rated capacity or lift involving two or more cranes shall be considered a critical lift. **A critical lift plan must be submitted to Doster Construction Company's Site Superintendent and Corporate Safety Director for review prior to the lift.** A sample plan and checklist can be found in Attachment C – Critical Lift Plan.

A pre-planning meeting to discuss the critical lift will be held in the field with the crew to discuss, at a minimum, the following:

- Calculation of gross weight load
- Load chart calculations
- Radius measurements anticipated during the lift
- Weather and soil conditions
- Overhead high voltage power lines and clearances

Calculations for the lift are to be reviewed during this meeting.

Crane Personnel Platforms – Lifting Personnel

The use of crane suspended personnel platforms is prohibited by Doster Construction Company unless the project can demonstrate that conventional methods to do the work are more hazardous or are infeasible. **Projects willing to implement a crane personnel platform have to get written approval to do so from the Corporate Safety Director.**

Operational criteria for lifting personnel with a crane is outlined under 29 CFR 1926.550(g).

Some criteria to follow is (and it is not limited to):

1. Personnel shall ride always standing on the floor of a permanent platform with approved safety handrails, wear safety harnesses attached to designated anchors, and be in clear view of the crane operator at all times.

2. Personnel platforms and suspension system shall be designed by a qualified engineer competent in structural design. All platform certification are posted on the personnel platform.

3. The total weight of the loaded personnel platform and related rigging shall not exceed 50% of the rated capacity for the radius and configuration of the crane.

References

ASME/ANSI B30.2, "Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)."
ASME/ANSI B30.9, "Slings."
ASME/ANSI B30.10, "Hooks."
ASME/ANSI B30.11, "Monorails and Underhung Cranes."
ASME/ANSI B30.16, "Overhead Hoists (Underhung)."
ASME/ANSI B30.17, "Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)."
ASME/ANSI B30.20, "Below-the-Hook Lifting Devices."
ASME/ANSI B30.21, "Manually Lever Operated Hoists."
Code of Federal Regulation, Title 29, Part 1910.179, "Overhead and Gantry Cranes."
Code of Federal Regulation, Title 29, Part 1910.184, "Slings."
Code of Federal Regulation, Title 29, Part 1926.550, "Cranes and Derricks."
Mechanical Engineering Department *Design Safety Standards*, Chapter 2.2, "Lifting equipment."
CMAA Specification No. 70, *Specifications for Electric Overhead Traveling Cranes.*
CMAA Specification No. 74, *Specifications for Top-Running and Under-Running Single-Girder Electric Overhead Traveling Cranes Utilizing Under Running Trolley Hoist.*
NFPA 70, Article 610, *Cranes and Hoists.*

Attachment A – Daily Pre-Operation Inspection Form

DOSTER
CONSTRUCTION COMPANY

Daily Pre-Operation Inspection

JOBSITE NAME:_____ JOBSITE CODE:_____

DATE: ____-____-____ TIME: _____ A.M. / P.M.

EQUIPMENT ID #: _____ ODOMETER/HOUR READINGS: _____

CARRIER / SUPERSTRUCTURE ITEMS: _____ NEXT SERVICE DUE: _____

Interior (CHECK ANY DEFECTIVE ITEM AND GIVE DETAILS UNDER REMARKS)

Pass	Fail		Pass	Fail		Pass	Fail	
☐	☐	Parking Brake	☐	☐	Mirrors	☐	☐	All Gauges (Air, Oil, Etc...)
☐	☐	Swing Brake	☐	☐	Steering Wheel (Slack)	☐	☐	Anti-Two Block Device
☐	☐	Travel Brake	☐	☐	All Light Switches	☐	☐	Load Moment Indicator
☐	☐	Oil Pressure	☐	☐	All Glass	☐	☐	All Limit Switches
☐	☐	Air Pressure	☐	☐	Fire Extinguisher	☐	☐	Load Charts
☐	☐	Low Air Warning Device	☐	☐	Fuses	☐	☐	Cleanliness
☐	☐	Warning Devices/Buzzers	☐	☐	All Control Mechanisms	☐	☐	Telescope
☐	☐	Horn	☐	☐	Swing	☐	☐	Auxiliary Hoist
☐	☐	Windshield Wiper	☐	☐	Automatic Boom Kick-Out	☐	☐	Main Hoist
☐	☐	Heater/Defroster	☐	☐	Boom Angle Indicator	☐	☐	Outrigger Control
☐	☐	Locking Devices	☐	☐	Boom Hoist	☐	☐	Other

Exterior (CHECK ANY DEFECTIVE ITEM AND GIVE DETAILS UNDER REMARKS)

Pass	Fail		Pass	Fail		Pass	Fail	
☐	☐	Headlights/Taillights	☐	☐	Torque Converter	☐	☐	Wedge Sockets
☐	☐	Clearance Lights	☐	☐	Transfer	☐	☐	Sheaves/Guards
☐	☐	Turn Signal/Hazard Lights	☐	☐	Drive Shaft/U-Joints	☐	☐	Block/Hook/Swivels
☐	☐	Lugs/Tires/Wheels	☐	☐	Differential	☐	☐	Boom
☐	☐	Fuel Tank/Cap	☐	☐	Front/Inter./ Rear Axles	☐	☐	Jib/Pins/Sheaves
☐	☐	Outrigger Controls/Locks	☐	☐	Master Cylinder	☐	☐	Counterweight Controls
☐	☐	Radiator	☐	☐	Hydraulic System	☐	☐	Rigging/Belts/Slings/Etc...
☐	☐	Drive Belts	☐	☐	Steering Gearbox/Controls	☐	☐	Swing Radius Barricaded
☐	☐	Air Tank/Lines	☐	☐	Springs/Shocks/Shackles	☐	☐	Visual Inspection of
☐	☐	Exhaust Lines/Muffler	☐	☐	All Lubricant/Fluid Levels	☐		Working Radius
☐	☐	Transmission	☐	☐	Hoist Drum Cables	☐	☐	Other

Remarks:

_____

_____

_____

☐ CONDITION OF THE ABOVE VEHICLE IS SATISFACTORY
☐ ABOVE DEFECTS CORRECTED
☐ ABOVE DEFECTS NEED NOT BE CORRECTED FOR SAFE OPERATION

Driver's Signature: _____

Mechanic's Signature: _____

Supervisor's Signature: _____

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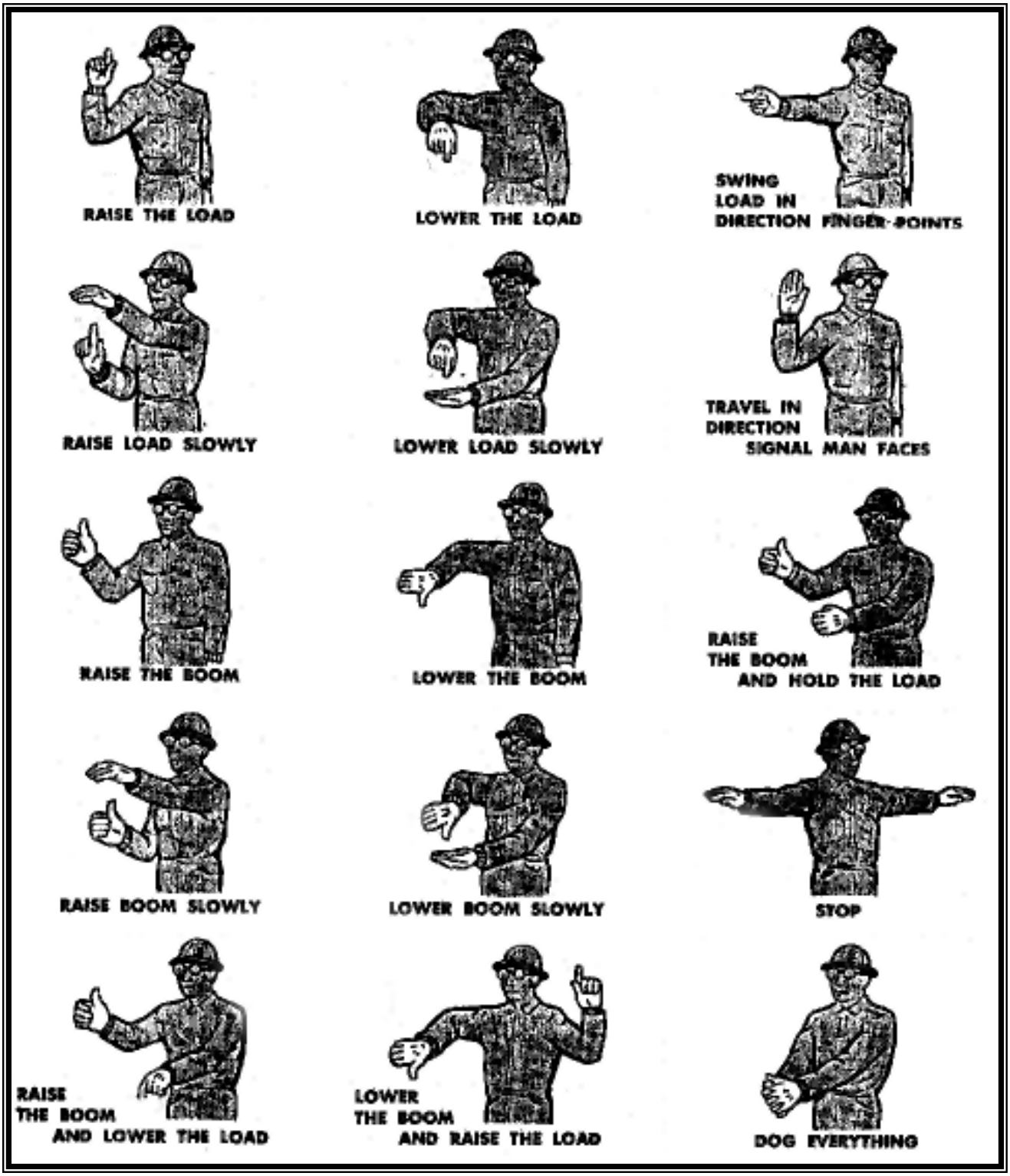
Attachment B - Crane Signals



Attachment C – Critical Lift Plan

DOSTER

Crane Critical Lift Plan

Project:		**Critical Lift Date:**			
1. Critical Lift Plan Due to (Check all that apply): ◯ Load capacity is equal or exceeds 75% of load chart rating. ◯ Two or more cranes will be used during the lift. ◯ Any unusual circumstances. Specify:					
2. Crane Description:					
3. Load Description:					
4. Load Weight: _____	Weight determined: _____				
5. Rigging Weight: _____	Type:	_____			
6. Total Weight:	Load				
	+ Rigging				
	+ Attachments				
	- Load Chart Deductions				
	Total Weight:				
7. Equipment:	Maximum Operating Radius:				
	Planned Operating Radius:				
	Allowable Load From Crane Load Chart:				
8. Clearances:	Clearance b/w boom and lift:				
	Clearance with surrounding objects:				
9. Ground / Stability:	Ground compact and stable:	Y		N	
	Outrigger Size:				
10. Weather:	Favorable:	Y		N	
	Predicted wind speed at lift time:				
		If wind exceeds 25 mph lift cannot proceed. *If wind exceeds 20 mph consider postponing lift.*			
11. Communication between signal man and Operator:					
	Hand Signals Two Way Radio Telephone Other	◯ ◯ ◯ ◯ Specify:			

DOSTER
Crane Critical Lift Plan

Page 2 -
12. Other Considerations:

- Procedures to safeguard pedestrian or other construction workers in vicinity:
  _____
  _____
  _____

- Additional Comments:
  _____
  _____
  _____

Acknowledgements:

Title	Signature	Date
Crane Operator	_____	_____
Crane Inspector (If Applicable)	_____	_____
Rigger		
Lift Supervisor	_____	_____
Signal Man	_____	_____
Site Superintendent		

NOTE: Only after ALL representatives have signed the Crane Critical Lift Plan the lift can proceed.

Section 30
A General Rigging Safety Requirements

Only select rigging equipment that is in good condition. All rigging equipment shall be inspected annually, defective equipment is to be removed from service and destroyed to prevent inadvertent reuse. The load capacity limits shall be stamped or affixed to all rigging components. Doster Construction Company safety policy requires a minimum safety factor of 5 to be maintained for wire rope slings.

The following types of slings shall be rejected or destroyed:
Nylon slings with:

- Abnormal wear
- Torn stitching
- Broken or cut fibers
- Discoloration or deterioration

Wire rope slings with:

- Kinking, crushing, bird caging, or other distortions.
- Evidence of heat damage.
- Cracks, deformation or work end attachments
- Six randomly broken wires in a single rope lay
- Three broken wires in one strand of rope
- Hooks opened more than 15% of the throat
- Hooks twisted sideways more than 10degrees from the plane of the unbent hook.

Alloy steel chain slings with:

- Cracked, bent or elongated links or components
- Cracked hooks

Rigging a load

- Do the following when rigging a load:
- Determine the weight of the load, do not guess.
- Determine the proper size for slings and components
- Do not use manila rope for rigging.
- Make sure that shackle pins and shouldered eye bolts are installed in accordance with the manufacturer's recommendations.
- Make sure that ordinary (shoulderless) eye bolts are threaded in at least 1/5 times the bolt diameter.

- Use safety hoist rings (swivel eyes) as a preferred substitute for eye bolts wherever possible.
- Pad sharp edges to protect slings. Remember that machinery foundations or angle iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load. Wood, tire rubber, or other pliable materials may be suitable for padding.
- Do not use slings, eye bolts, shackles, or hooks that have been cut, welded or brazed.
- Install wire rope clips with the base only on the live end and the U-bolt only on the dead end. Follow the manufacturer's recommendations for the spacing for each specific wire size.
- Determine the center of gravity and balance the load before moving it.
- Initially lift the load only a few inches to test the rigging and balance.

Crane overloading

Crane shall not be loaded beyond their rated capacity for normal operations. Any crane or hoist suspected of having been overloaded shall be removed from service by locking open and tagging the main disconnect switch. Additionally, overloaded cranes shall be inspected, repaired, load tested, and approved for use before being returned to service.

Hand signals

Signals to the operator shall be in accordance with the standard hand signals unless voice communications equipment (telephone, radio or equivalent) is used. Signals shall be discernible or audible at all times. Some special operations may require addition to or modification of the basis signals. For all such cases, these special signals shall be agreed upon and thoroughly understood by both the person giving the signals and the operator, and shall not be in conflict with the standard signals.

Inspection Maintenance and Testing:

All tests and inspections shall be conducted in accordance with the manufacturer's recommendations.

Rigging Guidelines

(to be read from left to right)

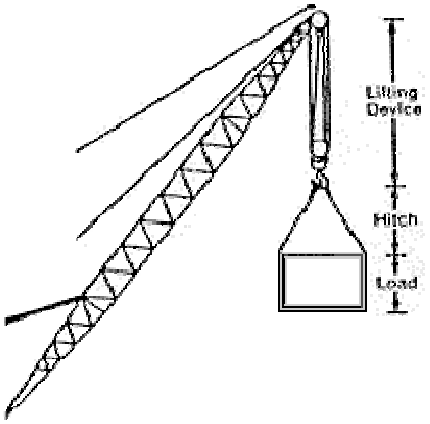
On the following pages are some useful tips to help the rigger do his job more efficiently and safely. Prevailing work rules and government regulations place full responsibility for proper performance upon the rigger, so it is his duty to be familiar with the condition and capability of all tools and equipment used, as well as techniques employed. One basic rule always applies: Always know ... never guess.

Each lift may be divided into three parts, providing a convenient plan for proceeding:

1. The Lifting Device - Know its capability and limitations, and its condition. When was it last inspected? If in doubt about capacity, check the placard.

2. The Hitch - Here is where the rigger can exercise ingenuity, but it's also the easiest place to make a mistake. This section can help you decide which sling to use, and how to rig it properly.

3. The Load - The weight must be known. But you must also protect the load from possible damage by the slings ... and protect the slings from damage by the load.



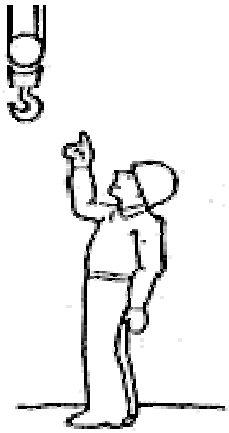
Is the lifting device adequate?

Check the placard on the crane or hoist, and then answer three questions:

1. Is capacity adequate for this lift?

2. Will it lift high enough?

3. Is horizontal reach adequate?



Check the hook and reeving.

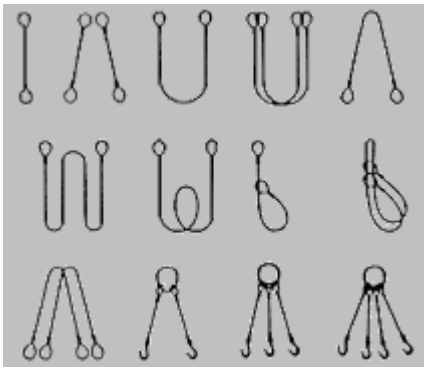
1. Are sheaves properly rigged? If multi-part reeving, will it support the load?

2. Is the hook the right size so sling eye won't be distorted when put over the hook?

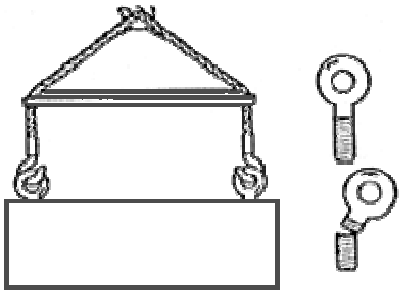
3 Check for cracks in bowl of the hook, and for evidence of point loading or bending to one side of 15% or more.

Before you select a sling for a specific lift, determine the most effective hitch to do the job, protect the load, and protect the sling. One of three basic hitches will usually do the job.

The type of hitch you select may determine the type of sling body that will best do the job, as well as the length of sling that will be needed. Lifting height, overhead clearance and hook travel will affect choice of hitch and length of sling.



When attaching a sling to eye bolts, always pull on line with the bolt axis. When hitching to bolts screwed into or attached to a load, a side pull may break the bolts.



When lifting crates or wooden boxes with a basket hitch, be sure load can withstand side pressure as tension is applied to sling. Use spreader bars and

Choose a sling body type which will best support the load while providing adequate rated capacity. The proper choice will provide:

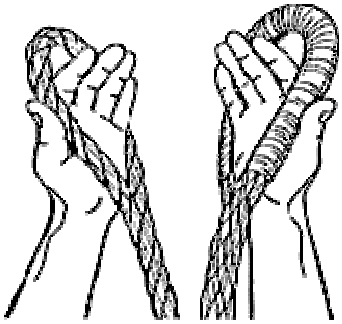
1. Lifting capacity needed.

2. Proper D/d Ratio.

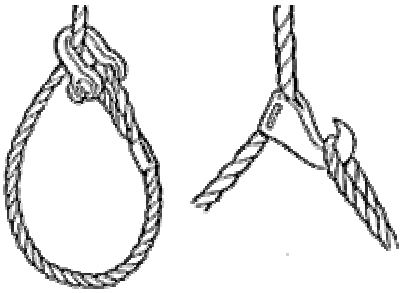
3. Handling characteristics needed for rigging.

4. Minimal damage to the sling.

5. Minimal damage to the load.



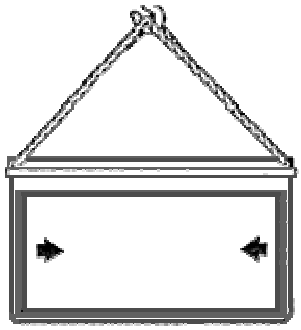
Use a shackle in the sling eye during a choke to protect sling body against excessive distortion. Always put shackle pin through sling eye, rather than against the sling body since sliding movement of sling body could rotate pin, causing it to come loose.



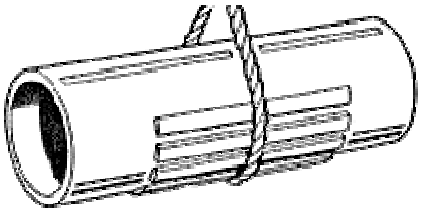
When lifting a bundled load with a single sling near the center of gravity, a choke is more effective than a basket hitch to prevent unbalance and slipping

Protect the sling during the lift with blocking or padding at sharp corners or where the sling body would be bent severely.

Use a spreader bar between legs of a sling to prevent excessive side pressure on the load by the sling during the lift.

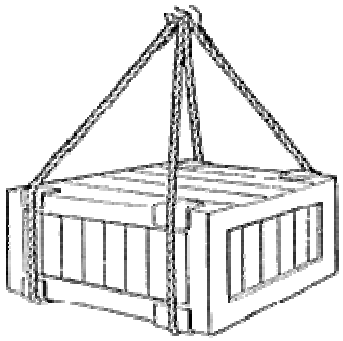


Use blocking or padding to protect hollow vessels, loose bundles and fragile items from scuffing and bending. Remember that blocking becomes part of the lift, and must be added to total weight on the sling.

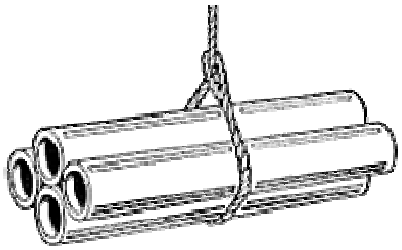


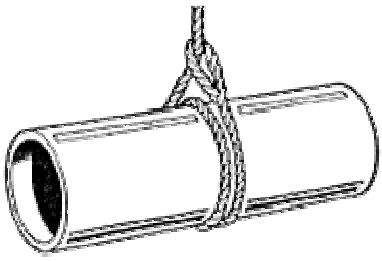
Some riggers will use a double wrap around the load, for 360° gripping of the load, to prevent slippage during the lift.

corner protectors to prevent damage to contents.

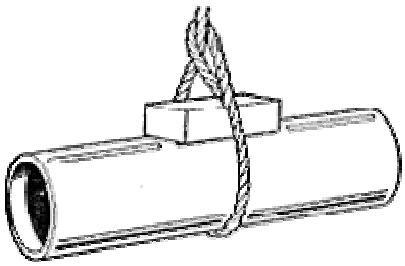


of the load in the sling.

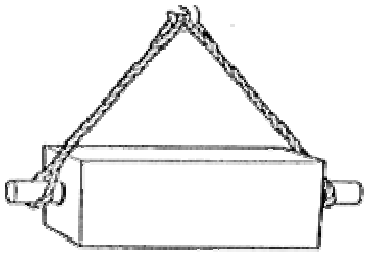




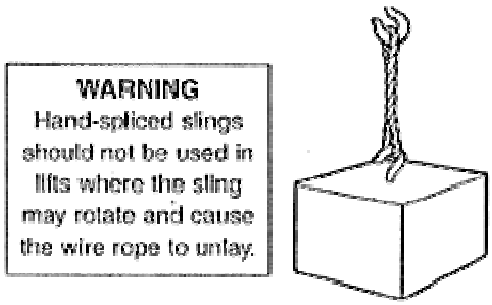
You can reduce the angle of a choke with a wooden block, or blocks, between the hitch and the load. This also increases the angle between the two legs to improve sling efficiency.



When rigging two or more straight slings as a bridle, select identical sling constructions of identical length - with identical previous loading experience. Normal stretch must be the same for paired slings to avoid overloading individual legs and unbalancing the load during the lift.



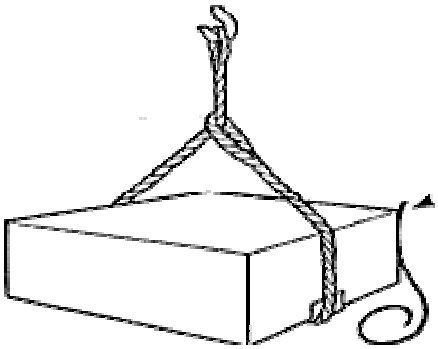
Single-part hand-spliced slings must not be permitted to rotate when rigged in a straight, vertical hitch. Rotation can cause the splice to unlay and pull out, resulting in dropping of the load.

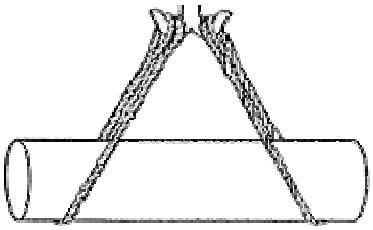


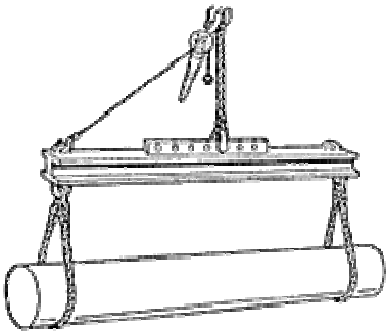
Anytime a load is lifted beyond arm's reach with a single-part load line or straight eye and eye sling, use a tagline to prevent load rotation. If a wire rope is permitted to rotate, the strands may unlay and the rope's capacity will be reduced.

Two basket hitches can be rigged with two slings to provide better balance for long loads. Be sure that slings cannot slide toward one another along the load when the lift is made.

Use an equalizing bar with double basket hitches to reduce tendency of slings to slide together and to keep loads level. By adjusting the hook point and using a come-along or chain block to support the heavy end, the load can be kept level during the lift.

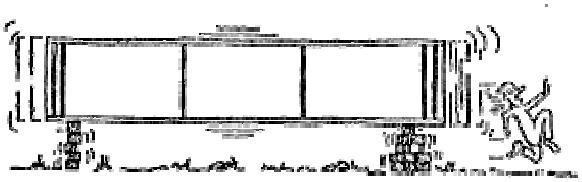




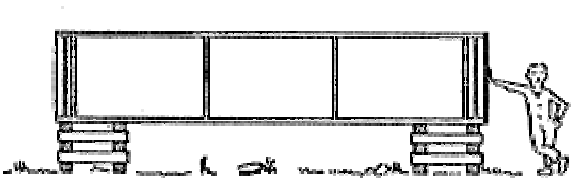


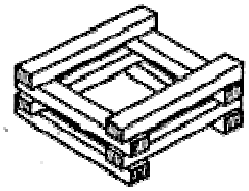
Proper Use of Cribbing

Incorrect



Correct





Section 31
Job Hazard Analysis / Hazard Assessment

Safety Action Plans

General

Safety Action Plans are a basic procedure for analyzing a scope of work for hazards establishing abatement methods and assigning responsibility.

There are five (5) basic steps involved in developing a Safety Action Plan:

1) Define the complete scope of work;

2) break the scope down to individual task;

3) identify the potential hazards and assessing the resulting risk;

4) Eliminate or reducing the risk at the source, where possible; and

5) Recommend safe procedures and or identifying control standards to abate the residual risks.

Once Safety Plans are developed they should be periodically reviewed to determine that if they are up-to-date, addressing hazards and applicable standards.

Procedure

1) Prior to commencing any scope of work a Safety Action Plan will be developed. The Superintendent will be provided the details of the scope, the crafts and or contractors to perform the work, the area the work is to be performed and the estimated start date.

2) The Superintendent will review the scope and identify all applicable client, Doster, State and Federal procedures / standards.

3) The Superintendent or his representative will complete a Safety Action Plan Form, listing the hazards, abatement procedures and responsible individuals.

4) The Safety Action Plan will be submitted to Client for review and comments.

5) A Kick off meeting will be scheduled with applicable Doster/ Project Management and Supervision responsible for the work activities.

6) The Safety Action Plan will be reviewed and supervision responsible for abatement measures will be identified.

7) A round table discussion will then be conducted utilizing the experience of all meeting attendees to identify any hazard(s) that may have been experienced before when performing similar work activities.

8) Abatement measures will be developed for any hazard(s) that are identified as a result of the round table discussion.

9) A copy of the completed Safety Action Plan will be issued to the client for review and signature approval. Upon Client approval, the Safety Action Plan will be distributed to all supervisors involved in completing the scope of work.

10) The completed Safety Action Plan will be reviewed on a weekly basis with all involved craft personnel. The JSAs contained within the plan will be used to assist the supervisors in developing daily Safety Task Assignment forms.

11) The Safety Action Plan will be updated if there is a change in the work scope or execution methods.

12) The Safety Action Plan will be reviewed at least monthly to determine if updating is required.

Safety Task Assignments

This procedure provides guidelines for all supervisors who assign work to employees. Additionally, it takes into consideration all aspects of the task to be performed with emphasis on safety.

General

1) Safety Task Assignment (STA) is showing or explaining to each employee the safety application that pertains to the job he/she is to do.

2) It is the responsibility of management down through foreman to give STA assignments to all employees, either individually or in a group before they actually begin any assigned task. The STA may only require a few words, but in many cases, it could require an actual demonstration of how the job can be done safely while pointing out any hazards that may be encountered in any task.

3) Supervisors can manage their business safely by assuring that every employee understands thoroughly every STA given to him/her on every job that he/she is to perform.

Procedure

1) Each supervisor shall review the Safety Action Plan applicable to the scope of work to be performed and must analyze each job or task for specific hazards before work begins. This will enable him/her to give accurate instructions for each job that his/her employees will be engaged in during that work shift.

2) The magnitude of the task will generally determine the extent of the STA. Some tasks will require only a few words of STA and others may take a more detailed explanation or other preparation for employees. All employees involved must be checked to ensure that they understand what they are expected to do to safely perform their task.

3) Each supervisor is responsible for giving STAs every day per group of employees. The STA should include any specific hazard that group may encounter, safety equipment, and any personal protective devices that may be needed.

4) Each supervisor will assign each employee to be alert to a designated hazard that may be encountered during the course of their work activities. These employees will report any hazard observed to the foreman for correction

   - It is the responsibility of the supervisor to initiate corrective action to the greatest degree necessary to achieve abatement of the hazard following notification by his employee.

5) STA Roster (Attachment A) should be posted in a conspicuous place near the work area. This will enable the employees to review the STA during the course of the day.

6) At the end of the shift, each employee will sign off on the Post Task Assignment section of the form prior to leaving the project.

- ***Clean As You Work; Good Housekeeping Promotes A Safe Working Environment***

TURN FORM IN TO PROJECT/SITE MANAGEMENT AT END OF SHIFT OR WHEN TASK IS COMPLETED.

POST SAFETY TASK REVIEW:

SUPERVISOR: _____
DATE: _____

1. Was anyone injured or did an unplanned incident occur today? If yes, explain.
   Yes _____ **No** _____
   _____
   _____

2. Was the accident/incident reported? _____

3. Problems or Concerns encountered?
   _____
   _____

4. What can be done tomorrow to improve performance?
   _____
   _____

6. Reviewed by:
   Supervisor: _____
   General Foreman: _____

ASSIGNED EMPLOYEES:

NAME	BADGE #
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Contractor Name _____

Today's weather _____

Doster Construction Company

Project Title
Location, Alabama?

SAFETY TASK ASSIGNMENT

SAFETY IS NO ACCIDENT!

SAFETY TASK ASSIGNMENT

The STA should be completed daily for each task. Post this STA in a conspicuous location throughout the length of the task. Each crew member involved with the task should sign this STA. At the end of the task, give this STA to the Project/Site Management. If deviation from known safe work practice/ procedure occurs, work must be stopped.

Supervisor: _____Date: _____
Location of Task: _____
_____
_____
_____
Task Description: _____
_____
_____
Does task require special training?
☐ Yes ☐ No
If yes, what type?
_____
_____

PERSONAL PROTECTIVE EQUIPMENT REQURIED:

	Yes	No	Type
Fall Protection	☐	☐	_____
Eye/Face	☐	☐	_____
Respirator	☐	☐	_____
Foot	☐	☐	_____
Hand	☐	☐	_____
Hearing ☐	☐		_____
FRC ☐	☐		_____

Other_____
_____
_____
_____

PPE Examples: Monogoggles, face shield, acid hood, sandblasting hood, welding (goggles, shield, sleeves), ear protection, gloves (leather, chemical resistant, gauntlets), rain suit, life vest, safety harness, breathing air assembly.

LIST PROCEDURES/PERMITS REQUIRED:

(i.e. Hot Work, Confined Space, Excavation, Crane Lift, Line Break, etc…)
_____
_____

EMPLOYEE CERTIFICATIONS REQUIRED:

	Yes	No
Crane Operator	☐	☐
Forklift Operator ☐	☐	
Mobile Equipment Operator	☐	☐
Powder-Actuated Tool User	☐	☐
Competent Person (lead, asbestos, excavations, confined space, hazardous material, scaffolds)	☐	☐
Other (specify)	☐	☐

GENERAL INFORMATION:

1. What are the hazards associated with the task? _____
_____
_____

Have they been explained to the employees? ☐ **Yes** ☐ **No**

2. Steps to eliminate/Control Hazards.
_____
_____
_____

TOOLS & EQUIPMENT:

3. User inspection is required of all tools, ladders, electrical cords, rigging and safety equipment. Has this been completed?
☐ **Yes** ☐ **No**

SCAFFOLDS/LADDERS:

4. Inspect all scaffolds/ladders before use. Has the the scaffold tag(s) been signed?
☐ **Yes** ☐ **No**

APPLICABLE PERMITS:

5. Is a fire watch or hole watch required?

☐ **Yes** ☐ **No**

EMERGENCY EQUIPMENT:

6. Identify below the location of the nearest Safety shower/Eye wash./Fire Equip.
_____

HOUSEKEEPING:

7. Are trash receptacles available in the work area?
Location: _____

FALL PROTECTION:

8. Have areas been identified as requiring fall protection systems and have they been installed? (i.e., static lines, barricades, hole covers, etc.) ☐ **Yes** ☐ **No**
Explain: _____
_____

FIRE PROTECTION:

9. Are flammable/combustible materials stored, separated, inspected and secured per procedure? ☐ **Yes** ☐ **No**

ASSIGNED EMPLOYEES:

Name	**Badge #**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

MY SAFETY PRINCIPLES

- ***Plan Every Job***
- ***Anticipate Unexpected Events***
- ***Use The Right Tool For The Job***
- ***Use Procedures As Tools***
- ***Know Your Surroundings***
- ***Report All Incidents/Accidents, Including Near Misses***

Section 32
Fleet Management – Accident Prevention

Preventable Accidents

Objective: To control or eliminate vehicle accident rates by establishing a company standard for safe driving.

Description: A preventable accident is one which occurs because the driver fails to act in a reasonably expected manner to prevent it. In judging whether the driver's actions were reasonable, one seeks to determine whether the driver drove defensively and demonstrated an acceptable level of skill and knowledge. The judgment of what is reasonable can be based on a company-adopted definition, thus establishing a goal for its safety management program.

The concept of a preventable accident is a fleet safety management tool which achieves the following goals:

- It helps establish a safe driving standard for the driver.
- It provides a criterion for evaluating individual drivers.
- It provides an objective for accident investigations and evaluations.
- It provides a means for evaluating the safety performance of individual drivers and all Company drivers as a group.
- It provides a means for monitoring the effectiveness of the vehicle safety program.
- It assists in dealing with driver safety infractions.
- It may assist in the implementation of a safe driving recognition program.

Driver Qualifications and Performance

Objective: To improve vehicle safety through training our qualified drivers and monitoring their performance.

Description: The great majority of preventable accidents can be shown to be directly related to the performance of the driver. It is therefore extremely productive to any vehicle safety program to have careful drivers and adequate monitoring procedures for those drivers.

Management:
Monitoring existing drivers' qualifications:

- A periodic review of driving records
- A periodic review of the drivers' health
- Drivers monitored for drug and alcohol abuse
- Identifying deficiencies in drivers' skills and knowledge and a procedure for remedial training
- An established procedure for terminating unqualified drivers?

Safe Driving Recognition

Objective: To encourage safe driving and improve driver awareness of safety.

Description: Safe driving recognition or an incentive program will be an integral part of our vehicle safety program. As appropriate, we will identify superior driving performance and set forth the selected drivers as examples to be emulated by the rest of the Company drivers.

Management:

- Use safe driving recognition to:
    - encourage safe driving performance
    - heighten driver safety awareness
    - Foster driver professionalism
    - focus the monitoring of individual driver performance and skills
    - help monitor driving performance and the effectiveness of the vehicle safety program

Driver Safety Infractions

Objective: To improve vehicle safety by remedial training or termination of unqualified drivers.

Description: Driving requires skill, knowledge, physical and mental health and character integrity. Public safety and company reputation requires that drivers be fully qualified. Drivers who are not qualified should receive remedial training or be terminated if they cannot be brought

up to the necessary level of competence.

Drinking and Substance Abuse

Objective: To prevent accidents caused by drivers under the influence by identifying and controlling abusers.

Description: It has been well documented that drivers under the influence of alcohol or drugs have been involved in about half of all fatal traffic accidents. Drinking or substance abuse by drivers of alcohol or drugs cannot be tolerated. Company management is acutely aware of the seriousness of this societal problem and has established procedures to effectively control it.

Drivers:

- Don't drink and drive.
- Don't abuse drugs, legal or illegal.
- Find out if prescription or over-the-counter medications may adversely affect safe driving.
- Get help fast if you have, or think you may have an abuse problem.

Illness and Fatigue

Objective: To prevent accidents caused by ill and fatigued drivers.

Description: Everyone understands how ill or fatigued drivers can be a hazard to themselves and others. Nonetheless, drivers sometimes push their bodies beyond reasonable limits and become a hazard anyway. This is why comprehensive state and federal regulations have been established. In addition to being law, these regulations are useful guides to both the driver and his supervisors in defining reasonable, sensible limitations on when medical conditions call for rest and no driving.

Drivers:

- Don't start a long trip unless you get a good sleep before you go.
- When possible, schedule your trips so that you drive when you are normally awake and you sleep when you are normally asleep. Don't throw off your body clock more than necessary.
- Be careful with any kind of medication. Many medicines can make you sleepy.
- If you get drowsy, don't drive. You're asking for problems. At least take a short nap until you can drive somewhere to get a good sleep.

Vehicle Safety Program and Supervision

Objective: To improve safe driving performance with an effective vehicle safety program.

Description: Safe driving performance is dependent on management commitment to the implementation of a formal vehicle safety program. An effective safety program will interact with most aspects of Company operations and challenge the skills and knowledge of its supervisors and drivers.

Management:

- Establish a formal vehicle safety program.
- Assign a designated person with responsibility for safety and compliance with regulations.
- The safety director to be given an opportunity for professional development by attending training seminars and industry related association meetings.
- The company and its supervisory staff will maintain membership and remain active in trade and professional associations.
- Safety management to:
    - screen new drivers
    - monitor driver qualifications and safety infractions
    - provide training to upgrade driver skills and knowledge
    - provide a formal mechanism for investigating and reviewing accidents
    - implement safe driving incentives
    - monitor maintenance and equipment safety
    - oversee and implement regulatory compliance

- establish vehicle safety standards
- communicate program goals to drivers and supervisory personnel
- monitor program effectiveness
- offer recognition to drivers who meet the required standard of performance

Driver Training Aids

Objective: To improve vehicle operations safety through use of training aids.

Description: It is important to determine what mix of audio-visual aids, posters, manuals, pamphlets and other literature is most effective in improving the company's training program. Advice is available from a number of organizations.

Section 33
Office Safety

Offices are safe places to work in compared to industrial and construction sites, but injuries that do occur in office environments are not inconsequential, and can result in disabling injuries. Be aware of your surroundings and your activities in an office, and consider the possible consequences just as seriously as you would in totally unfamiliar surroundings. An office may not look or sound like a sawmill or foundry, but if you are not paying attention to a hazard because it doesn't look scary, it can still hurt you quite badly.

Common Accident Types

Falls
Falls are the most common office accident. Injuries may result from slips, or falls from chairs and elevations. Slip and trip injuries may be caused by wet floors, worn footwear, trash on the floor, or a combination. Chair falls can occur when a person sits, rises, or moves on a chair. Leaning back and tilting chairs are also causes. Falls from elevations are represented by situations when standing on chairs or other office furniture, and ladders.

Overexertion
Injuries due to overexertion occur when employees attempt to move heavy objects. Reaching, stretching, twisting, bending down, and straightening the spine are associated with these injuries. Even activities which do not appear likely to strain a person's stamina can result in severely painful injuries. For example, a person's back can be "thrown out" from no more than bending down incautiously to pick up a piece of paper.

Striking Against
"Striking against" objects include injuries resulting from bumping into doors, desks, file cabinets, open drawers, and other individuals.

Objects Striking
"Objects striking" workers usually involve a falling object - file cabinets, drawers, office machines, and doors. In our seismically active location, consideration should be taken in how shelves are loaded and protected, especially when someone normally sits beneath the stored materials.

Repetitive Motion
Repetitive motion injuries, also known as "cumulative trauma", include tendonitis and carpal tunnel syndrome. Computer keying is a frequently cited cause of this injury, although it has many causes and confounding factors. Prevention of repetitive motion injuries involves addressing issues pertaining to an individual's workstation and work habits. If you suspect you are at risk of such an injury, inform your supervisor and request a workstation ergonomic evaluation from Safety.

Accident Prevention
To control any type of accident, hazards must be eliminated and exposures reduced. Office design should be efficient, convenient, and safe.

File Cabinets
File cabinets are a common source of injuries. File drawers should be kept closed when not removing or replacing materials. A full top drawer with empty or partially filled bottom drawers can cause the cabinet to tip over. File drawers should not open to narrow aisles. Do not place cabinets next to doors. During earthquakes, unsecured cabinets have fallen over, blocking doors. Cabinets should be bolted together or fastened to the floor or wall. Don't store heavy materials on top of cabinets.

Aisles
Aisles through work areas should be unobstructed. Wastebaskets should be placed where people will not accidentally trip over them. Obstructions, including electrical cords, should be placed against walls or partitions, under desks, or in corners. Worn or warped mats under chairs should be replaced. Rubber or plastic rain mats should be replaced when torn or when the edges are curled.

Extension Cords
Use of electric extension cords should be avoided if at all possible. Extension cords are designed for temporary use only, meaning they cannot replace permanent wiring for equipment. Cords should be kept out of aisles, and if cords must cross the floor, they need to be covered with rubber mats designed for this purpose.

Electrical Appliances

Electrical appliances need to be maintained and regularly inspected for defects. Only U.L.-listed appliances are acceptable. Frequent removal of plugs from electrical outlets reduces the life expectancy of the cord. Appliances should have power switches so that the plugs do not need to be removed to shut off power. Portable space heaters are **NOT** allowed in the Doster Construction Company building.

Office Equipment

Office equipment should not be placed near the edge of tables or desks. Heavy equipment, including computers and monitors, should be secured to prevent it from falling over. Heavy or awkward loads should be moved by at least two individuals. Don't attempt to move furniture alone. Use stepstools or stepladders instead of chairs to reach high shelves. Electrical appliances, including paper shredders and Computers, need to be grounded or double insulated.

Guidelines

Infection Control During Construction and Renovation in Hospitals

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Section 34
Guidelines for Doster Construction Company, Inc. Infection Control during Construction and Renovation

1.0 Introduction

1) Airborne and waterborne fungi and other microorganisms, such as species of Aspergillus, Mucoraceae, Fusarium, Acremonium, Penicillium, and Legionella, can create significant risks to patients, particularly to immunocompromised patients.

2) Transmission can occur directly by inhalation of aerosolized organisms or airborne spores, or into open wounds. Outbreaks of environmentally spread airborne infections from fungi and other microorganisms have been documented in facilities from contaminated, aerosolized water or moisture damaged materials or contaminated dust.

3) Many of the outbreaks have occurred as a result of construction, renovation, or general maintenance and repairs when moisture damaged or dust laden materials such as sheet rock, wood, wall coverings, carpet, fabrics, building materials, and from outside excavation. Fungal infections in patients are extremely costly and difficult to treat. Patients frequently do not survive even with effective treatment.

2.0 Objective

1) Establish a working outline Infection Control Measures to be used in hospital renovation and construction.

2) Conduct construction and renovation activities in such a manner as to minimize health risks for patients, hospital staff, and construction personnel.

3.0 Policy

1) Doster Construction will consult with facility designated professionals concerning issues relative to Infection Control. Designated professionals can include, but are not limited to the project architect, infection control coordinator, facilities planning development, and other appropriate hospital staff.

4.0 Infection Control Risk Assessment (ICRA)

1) An Infection Control Risk Assessment (ICRA) is conducted for each phase of each project and details specific engineering controls (including barrier specifications), work practice controls, personal protective equipment (PPE), debris transfer routes, as well as any additional details necessary to ensure the safety of patients and staff during the project.

2) The ICRA is drafted by the hospital's designated infection control representative prior to project startup.

3) The ICRA is drafted with consultation and cooperation from all affected parties, including Doster Construction, Facilities Planning and Development, Infection Control, and other pertinent suppliers and healthcare workers.

5.0 The Infection Control Permit

1) The Infection Control Permit defines appropriate controls according to the Risk Classification defined in the hospitals infection control policy (Refer to Appendix A for a sample infection control permit).

6.0 Training

1) All Doster Construction employees and subcontractors shall be trained in reference to this policy and the site specific infection control procedures as documented in the ICRA.

7.0 General Requirements / Responsibility – Doster Construction

1) Doster Construction requires that all subcontractors, material suppliers, vendors, employees, or agents be bound by the requirements in this guideline, and the facility owner's policy. This includes all construction projects contracted to Doster Construction.

General requirements include:

1.1. A copy of the Infection Control Permit is obtained and displayed in a visible location at the work site prior to beginning work. Construction workers will abide by the requirements in the Infection Control Permit and Infection Control Risk Assessment (ICRA).

1.2. Any hazard warning signs (e.g., 'Dust Hazard', 'Keep Door Closed', 'Unauthorized Traffic Not Permitted') are posted and maintained in a visible location

1.3. Recommended engineering controls, including but not limited to barriers, HEPA filtered negative air machines, tacky mats, personal protective equipment, and cleaning products are obtained prior to project start.

1.4. Prior to the onset of job duties, construction personnel are provided education and training on all applicable worker safety regulations, risks that construction activities present to the health care environment, and methods to eliminate, prevent, and control those risks.

1.5. Doster Construction will notify the Infection Control department immediately if unexpected environmental contamination from biohazardous agents are suspected or encountered during demolition or any other phase of the project. Environmental contamination includes the presence of visible mold, or moisture damage to building materials.

8.0 General Requirements / Responsibility – Facility Owner

1) It is incumbent upon the facility owner to ensure the following:

1.1. A risk assessment is conducted prior to each phase of the project.
1.2. Infection Control Permits are issued to Doster Construction at least 30 working days prior to the beginning of the project.
1.3. Any needed traffic controls are in place at the onset of construction, and that there has been adequate communication of those controls or changes to hospital workers, professionals, patients, and visitors.
1.4. All HVAC controls (including, but not limited to, air pressure, balancing, filter changes) are met at all times during the project.

1.5. Work sites are monitored regularly and those specified infection controls are in place and maintained.
1.6. Doster Construction, and all subcontractors, are informed when workers may have the potential for occupational exposure to blood and body fluids, and or tuberculosis.
1.7. Traffic controls and practices shall be implemented to assure the safety of patients is included in the planning process.
1.8. Prior to the construction of barriers or the start of the renovation or construction project, hospital personnel must remove any hazardous materials, including medical waste, sharps containers.

9.0 Engineering Controls - Barriers

1) Air tight enclosures or barriers are used to seal dust and debris inside the work site according to specifications provided by the architect, and detailed in the ICRA.

2) For projects that can be safely contained in a closed or isolated room or area, close doors and windows and seal with duct tape applied over the door frame.

3) Construction, demolition or renovation that is not capable of containment within a single room must be constructed with the following general specifications:

4) Barriers may consist of drywall, plywood barriers, or heavy duty plastic that is attached to a wooden or steel frame. Barriers should maintain sufficient adhesive strength to support the weight of the material plus all stresses encountered while passing through the opening during the duration of the project.

5) Barriers shall be sealed at all joints, penetrations, ducts, holes, etc to stop movement of air and debris.

6) If the ceiling grid is removed, barriers must be constructed to the deck to ensure proper maintenance of negative pressure, and to minimize potential negative effects on adjacent air handling systems.

7) When openings are made into existing ceilings exterior to the renovation containment, Kontrol Kubes or other barrier(s) (such as 6mil polyethylene) are used to provide enclosures around ladder, sealing off openings and fitted tight to ceiling and floor.

10.0 Engineering Controls – Anterooms

1) When feasible, anterooms are constructed for major projects. Anterooms must be of adequate size to allow workers to don and doff protective clothing, damp wipe shoes, house PPE, and a HEPA filtered vacuum cleaner.

11.0 Engineering Controls – HEPA Filtered Air Machines

1) HEPA filtered air machines shall be provided by the facility owner.

2) HEPA filtered air machines are placed inside the renovation area to 1) Minimize concentration of airborne contaminants, and 2) Maintain the differential pressure inside the worksite that is negative relative to patient care areas.

3) Performance requirements for HEPA filtered negative air machines when used to filter dust and particulate matter:

4) The negative air machines must yield a pressure differential of not less than 0.02 inches of water negative pressure inside the renovated areas, relative to patient care areas.

5) Unit(s) must be able to run continuously and be connected to emergency power and ganged to a single switch for emergency shutoff.

6) Filters are checked at regular intervals throughout the day and replaced as often as needed.

12.0 Additional Controls – Detailed in the ICRA

1) Seal all return vents and damper all supply vents prior to start of project. This may require additional negative air machines.

2) Supply diffusers and supply ductwork servicing the areas being impacted should be dampered down so the static pressure in the impacted area is negative to the surrounding areas. If possible, conditioned supply air should still circulate within the confines of the impacted area to help control humidity and condensation that can form while working next to a fully conditioned and controlled space.

3) Implement dust minimization methods to minimize levels of airborne dust, such as using drills with vacuum traps, wet cutting materials, performing cuts outside facility, misting dusty surfaces lightly.

4) Use tacky mats or walk off-mats inside work areas or anterooms to help prevent tracking of dust outside the site.

5) Keep all doors and windows, holes, openings to the work site sealed and closed.

6) Use designated hallways, stairwells, elevators.

7) Damp wipe all dust from all tools, equipment, and carts (including waste carts) and wheels prior to leaving the work area.

8) Reduce dust in work areas by vacuuming floor or damp mopping surfaces.

13.0 Personal Protective Equipment

1) Doster Construction shall use shoe covers, or damp wipe work boots or shoes immediately prior to leaving the construction area.

2) Doster Construction recognizes that donning coveralls over clothing immediately prior to leaving the construction area may be required in high-risk areas.

14.0 Environmental Cleaning and Waste Disposal

1) Approved hospital grade disinfectants should be used for disinfecting surfaces.

2) Any debris or dust tracked outside the barrier shall be removed immediately. Cleaning outside barrier to be by HEPA filtered vacuum or damp mop.

3) Manage disposal of waste and debris properly. Cover all waste containers tightly with heavy-duty plastic, or alternative suitable method.

4) If debris must be transferred through the hospital, clean the exterior of carts with a hospital grade disinfectant prior to removing it from the work site.

5) If demolition chutes are used for debris transfer, the chute openings should be sealed when not in use. If needed to control dust migration, the chute and dumpster will be sprayed with amended water to maintain dust control. Dumpsters should not be placed adjacent to air intakes.

6) The facility owner is responsible for the terminal cleaning of the construction zone prior to the opening of the newly renovated or constructed area following final clean-up of debris, bulk dust by construction workers, unless specific responsibility is defined in the construction contracts.

15.0 Environmental Monitoring

1) The facility owner will evaluate the effectiveness of completed barriers and other methods of control in place prior to the start up. Thereafter, Doster Construction, or their representative, will conduct continuous pressure differential monitoring for the duration of the project. The monitor shall be tied into a phone line, to allow the notification of the appropriate parties of the pressure loss.

2) The project shall stop if the containment becomes positively pressurized relative to patient care areas.

16.0 Enforcement of Infection Control Policies

1) The Doster Construction Project superintendent shall be responsible for enforcement of infection control procedure compliance by all subcontractors and suppliers. See Appendix B for sample daily compliance checklist

17.0 Completion Phase

1) Prior to the removal of barriers/seals, the work site must be cleaned of equipment and debris. The area is thoroughly vacuumed and mopped by the construction team.

2) Following barrier removal, the owner shall thoroughly clean and disinfect all surfaces, including floors, windows, sinks, fixtures, counters, walls and ceilings before being placed into service.

3) Water supply lines will be thoroughly flushed before placing newly renovated or constructed areas into service.

4) The air balance will be re-checked due to the dampening of the supply air and sealing of the return vents.

18.0 References:

Environment of Care; *Essentials for Health Care, 2nd Edition*, Joint Commission on Accreditation of Healthcare Organizations; Oakbrook, IL; 2002. EC 3.2.1pp.38-40, and EC 1.7 pp.37-38, 44-63, & 211-213.

Healthcare Infection Control Practices Advisory Committee (HIPAC); *Draft Guideline for Environmental Infection Control in Healthcare Facilities*, Centers for Disease Control and Prevention, Atlanta, GA; 2001.

Association for Professionals In Infection Control and Epidemiology; *APIC Text of Infection Control and Epidemiology, Volume 1*, APIC, Washington, DC; 2000.

Association for Professionals In Infection Control and Epidemiology; *APIC Tool Kit for Infection Control in Construction*, APIC, Washington, DC; 2002.

19.0 Appendix A: Sample Infection Control Permit

Infection Control Permit

xyz Infection Control Department	
Location of Construction:	Project Start Date:
Project Manager:	Estimated Duration:
Contractor: Doster Construction	Permit Expiration Date:

Risk Classification Matrix

	CONSTRUCTION ACTIVITY	**Construction Type**				
Light: A	Inspection, non-invasive activity, no dust.	**Risk Group**	**A** Light	**B** Small	**C** Major	**D** Heavy
Small B	Small scale, short duration (2 days), minimal. (Installing phone/computer cables, chase access, drilling/cutting walls or ceiling where dust migration can be controlled.)	**1, Very Low** **2, Low**	I I	II II	II III	IV IV
Major: C	Activity generates moderate to high levels of dust, requires > 2 days to complete.(sanding walls, removing floor coverings, duct- work, major cabling.)	**3, Moderate**	I	III	IV	IV
Heavy: D	Major demo and construction activities; high dust levels. (heavy demo, removal of complete ceiling system, new construction)	**4, High**	III	III or IV	IV	IV
Class 1	1. Execute work by methods to prevent raising dust from construction operations. 2. Immediately replace any ceiling tile displaced for visual inspection.	3. No more than 1 ceiling tile/50 ft. at the time can be removed				
Class 2	1. Provide active means to prevent air-borne dust from dispersing into atmosphere 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. Remove, seal or isolate HVAC system in areas where work is being performed.	5. Contain construction waste in tightly covered, sealed containers or plastic bags before transport. 6. Place dust mat inside egresses. 7. Wipe surfaces with disinfectant frequently. 8. Wet mop and/or vacuum with HEPA filtered vacuum work site at end of each work shift.				

Class 3	1. Obtain/Post infection control permit at work site before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of the duct system. 3. Complete critical barriers before work begins. 4. Seal all intake and return ducts, holes, pipes, conduits, unused doors/windows, and punctures appropriately. 5. Seal zippered or solid doors to the work site and any adjacent patient windows before construction begins. (No plastic flap doors permitted). Doors must remain closed at all times. 6. Maintain negative air pressure using HEPA equipped air filtration units within work site; check filters weekly and change as needed. 7. Vacuum work site and adjacent areas with HEPA filtered vacuums, including exterior corridor at end of shift and more often as needed.	8. Wet mop work site including exterior corridor (unless carpeted) with disinfectant at end of shift. 9. Water mist work surfaces to control dust 10. Use tacky mats immediately inside work entrances. 11. All equipment carts & wheels, leaving work site must be damp wiped inside anteroom. Put tack mats inside anterooms only, not inside restricted Pt area. 12. Contain construction waste and mist contents before placing in containers/carts, then tightly cover the top with plastic and seal securely with duct tape. 13. Do not remove barriers from work area until project completed & thoroughly cleaned. 14. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. ❒ Use PPE (shoe covers, overalls), when entering hospital halls, etc. from work site. ❒ Construct anteroom (if checked) .
Class 4	**5) Follow all requirements of Class 3 above; in addition, all of the requirements listed below.** 6) Construct anteroom at egress areas and require all personnel to pass through to exist work site. 7) Doors to anteroom and into the work site must remain closed at all times. 8) Workers leaving the work site must remove as much dust as possible from their clothing and shoes. 9) Prior to leaving anteroom, workers must don protective overalls (or cover gowns) and damp wipe shoes or put on clean shoe covers if entering into the hospital. This is not required for going outside. 10) Shoe covers, covers for clothing are removed upon returning to the anteroom and discarded in a container inside the anteroom if entering into the hospital. This is not required for going outside.. 11) Barriers must go to structure above ceiling.	
Permit Requested on (date)DosterDoster__ by:		Permit Authorized on (date) DosterDoster_by: RN, CIC

Class 3 & 4, Major and Heavy Projects	Y	N	N/A
• Infection Control Permit Posted in construction site			
• Signs, posters for safety and traffic control posted			
• HVAC sealed, isolated			
• Barriers or Kontrol Kube intact and completely sealed			
• All intakes, return ducts, holes, pipes, conduits, unused/ windows sealed			
• Doors to egresses are closed, sealed or secured to prevent dust from escaping			
• Work site is at negative air pressure to surrounding areas			
• HEPA equipped air filtration unit(s) (scrubber) is used and ducted properly			
• HEPA filter in air scrubber(s) is clean			
• There is no dust outside the immediate work site or in adjacent areas			
• Dust is vacuumed, not swept			
• Surfaces are wet mopped daily using disinfectant, if appropriate for surface			
• Tacky mats at entrances or in anterooms are fresh (sticky)			
• Carts or containers of waste are sealed securely with plastic before leaving the work site			
• Wheels, surfaces of equipment, carts are damp wiped before leaving work site.			
• Shoe coverings, coveralls used according to IC permit requirements			
• Anteroom is intact and used according to IC permit requirements			
For Class 4 only			
• Doors to anteroom and work site remains securely closed			
• No dust is tracked from work site			
• Shoes are damp wiped or vacuumed with HEPA vacuum prior to leaving work site inside anteroom			
• Coveralls or cover gowns are put on over clothing prior to leaving work site inside anteroom			
• All PPE is removed inside anteroom and discarded in a waste container			

Comments:

Corrective Actions:

IC Pre-Release Checklist:

— Environmental Services is thoroughly cleaned and disinfected all floors, sinks, walls, and all other surfaces.

— Barriers are carefully removed and discarded in covered containers.

— HVAC ducts/ vents cleaned and free of debris.

— HVAC filters changed.

— Air has been allowed to run for Doster__ hrs to evacuate dust particulate matter.

— Water lines flushed.

— If biological samples are indicated by Infection Control, please list sources and date obtained.

—

Source:	Date:
1.	
2.	
3.	
4.	

Signature of Project Manager: _____

Date: _____

20.0 Appendix B: Infection Control Onsite Checklist

Project: Date: Time:

Project Coordinator: Location: Contractor:

TABLE 1: Onsite Checklist for

ITEM	Compliance?			COMMENTS
	YES	NO	N/A	
1. CONSTRUCTION BARRIERS				
Barrier integrity maintained, no penetrations.				
Doors close and seal properly.				
Adjacent ceiling areas intact.				
2. NEGATIVE AIR				
Containment area negatively pressurized, relative to adjacent patient care areas.				
All windows and doors closed behind barrier.				
Negative air machine(s) operating properly.				
Negative air machine(s) filters clean.				
Negative air discharge hose(s) intact.				
3. DEBRIS REMOVAL				
Personnel use pre-designated egress routes for debris removal.				
Debris elevator/egress is free of visible dust accumulation. Dry sweeping is not conducted.				
Carts are kept clean, including wheels, prior to egress from the work site.				
Carts transporting debris are covered appropriately.				
High risk patients are not transported in debris elevator.				
HEPA vacuuming of worker clothing and/or workers wearing appropriate clothing barriers				
(e.g. shoe covers and/or clothing covers) in occupied facility				
4. FLOOR MATS				
Mats are vacuumed regularly and free of debris accumulation.				
Sticky mats changed as needed.				
5. CLEANLINESS OF AREA				
Construction area is reasonably clean, with little dust or debris accumulation.				
Adjacent occupied areas, NO dust or debris accumulation.				

Section 35
Content Responsibility

This manual is intended as a guide and the basis for the Corporate Safety Philosophy of the Doster Construction Company, Incorporated. This manual also purports to address Statutory Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor, and other Regulatory Agencies. It was composed, edited, authored, or copied as original material, or reprinted from State and Federal Government Agencies, Education Institutions, Trade Organizations, or construction vendors. All material is believed to be 100% non copyright data, and every effort was made to insure this fact.

Signed: _____

Section 36
Hurricane Emergency Plans

Hurricane Season

Hurricane Season runs June 1 through November 30 in the northern hemisphere and December 1 through April 30 in the southern hemisphere. Studies of recent hurricanes show that direct and indirect damage may be significantly reduced by implementing a comprehensive Hurricane Emergency Action Plan. An effective plan includes action steps addressing conditions before, during, and after a storm.

Hurricane Categories Defined

The way storm surge, wind and other factors combine determines the hurricane's destructive power. To make comparisons easier and to make the predicted hazards of approaching hurricanes clearer to emergency forces, National Oceanic and Atmospheric Administration's hurricane forecasters use a disaster-potential scale which assigns storms to five categories. This is the Saffir-Simpson Hurricane Scale. This scale can be used to give an estimate of the potential property damage and flooding expected along the coast with a hurricane. Following are descriptions of the five categories used:

Category 1:
Winds of 74 to 95 mph (120 to 153 km/hr). Possible storm surge 4 to 5 ft. (1.2 to 1.5 m) above normal. Damage primarily to shrubbery, tree foliage, and unanchored mobile homes. No real damage to other structures. Some damage to poorly constructed signs. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings.

Category 2:
Winds of 96 to 110 mps (154 to 177 km/hr). Storm surge of 6 to 8 ft. (1.8 to 2.4 m) above normal. Considerable damage to shrubbery and tree foliage. Some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage to roofing materials of buildings. Coastal roads and low-lying escape routes inland cut by rising water two to four hours before arrival of hurricane center. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying islands required.

Category 3:
Winds of 111 to 130 mph (179 to 209 km/hr). Possible storm surge 9 to 12 ft. (2.7 to 3.6m) above normal. Limbs torn from trees and large trees blown down. Practically all poorly constructed signs blown down. Damage to roofing materials of buildings, some

window and door damage. Mobile homes destroyed. Serious flooding at coast and many smaller structures near coast destroyed. Larger structures near coast damaged by battering waves and floating debris. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Flat terrain 5ft. (1.5m) or less above sea level flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences within several blocks of shoreline possibly required.

Category 4:
Winds of 131 to 155 mph (211 to 249 km/hr). Storm surge 13 to 18 ft. (4 to 5.5 m) above normal. Flat terrain 10 ft. (3 m) or less above sea level flooded inland as far as 6 miles (9.6 km). Shrubs and trees blown down, all signs down. Extensive damage to inadequately installed roofing materials, windows, and doors. Complete failure of roofs on many small residences. Complete destruction of mobile homes. Major damage to lower floors of structures near shore due to flooding and battering of waves and floating devices. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Major erosion of beaches. Massive evacuation of all residences within 500 yards of shore possibly required, and of single-story residences on low ground within 2 miles (3.2 km) of shore.

Category 5:
Winds greater than 155 mph (249 km/hr). Storm surge greater than 18 ft. (5.5 m) above normal. Shrubs and trees blown down, considerable damage to roofs of buildings; all signs down. Very severe and extensive damage to windows and doors. Complete failure of roofs of many residences and inadequately designed industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings overturned or blown away. Complete destruction of mobile homes. Major homes to lower floors of all structures less than 15 ft. 4.6 m) above sea level within 500 yards of shored. Low-lying, escape routes inland cut by rising water three to five hours before hurricane center arrives. Massive evacuation of residential areas on low ground within 5 to 10 miles (8 to 16 km) of shore possibly required.

Pre Hurricane Planning

A Hurricane Emergency Action Plan should be developed to include an Emergency Response Team (ERT, usually the Site Superintendent, Assistant Superintendent, or on site Project Manager), storm tracking procedures, specific procedures for proper facility preparedness and shutdown, as well as coordination with local authorities, such as police and fire departments, Civil Defense, Federal Emergency Management Agency (FEMA) and others.

Elements of a typical Emergency Action Plan include the following:
The ERT should consist of volunteer members willing to stay on site during the hurricane (if allowed by local authorities). The members should be trained in all aspects of the Emergency Action Plan and include representatives with decision-making authority as well as knowledge of facility operations. Security personnel may also be required.

Conduct drills to test all aspects of the Action Plan on an annual basis and ensure that the plan reflects current conditions at the location. Additionally, request feedback from ERT members to assess the effectiveness of the plan and to identify areas for improvement. Pre-planning with local authorities should be done so that resources and Emergency Action Plan steps are coordinated. Storm tracking procedures should be developed and include personnel capable of monitoring conditions using various media and equipment (e.g., radio, television, internet and portable phone).

Jobsite or Facility Shutdown

Procedures for proper job site preparedness and shut-down should be developed and tested on a regular basis. Such procedures typically include:

- Creating a backup of the computer system data.
- Removal of any loose yard and roof debris.
- Obtaining materials such as tarps, cables, straps, lumber and steel to anchor and/or brace yard storage, cranes and roof-mounted equipment.
- Verifying emergency supplies for ERT members (e.g., non-perishable food, flashlights, camera and communication devices).
- Obtaining an emergency generator (owned or rented) capable of providing power for life safety systems and critical equipment (i.e., coolers, freezers, and communication equipment).
- Establishing methods of safely shutting down operations and protecting key equipment and materials.
- All hazardous and/or reactive materials should be identified, with provisions to safely store, neutralize or relocate the materials to a safe location.
- Protecting building openings with storm shutters, pre-fitted plywood, or other coverings to minimize damage from flying or floating debris.
- Covering key stock and equipment with waterproof sheets. Also, consider raising or relocating extremely sensitive items.
- Developing pre-arranged plans with contractors and vendors for equipment and supplies that may need to be obtained outside the affected area.

Impending Hurricane Procedures

Typically, the National Weather Service provides 24 to 48 hour warnings before a hurricane is likely to approach landfall. Two terms are used with the National Weather Service notices:

Hurricane Watch: Notice whenever there is a threat of hurricane conditions within 24-36 hours.

Hurricane Warning: Notice when hurricane conditions are expected within 24 hours or less. Once the warning has been issued, the following should be implemented:

- The Hurricane Action Plan should be deployed, with the hurricane front being tracked and the ERT notified and on standby. Implement procedures to properly shut down operations.
- Take photos of project conditions prior to the time that the storm impacts the area.
- Examine the roofs and repair damaged covering, flashing, gutters or drains.
- Remove any loose yard and roof debris and moveable equipment. In addition, provide proper anchoring of yard and roof mounted equipment. Dumpsters need to be emptied or covered to prevent debris from becoming airborne, anything not secured may become a damaging projectile.
- Only when applicable, for ERT members staying on site, ensure all emergency supplies and equipment are on-site and in proper operation. Cash should be on hand for post-hurricane needs such as paying for food, emergency supplies, employees and contractors.
- Make sure that all equipment on site is topped off with fuel and have extra fuel available prior to the storm impacting area. Equipment may be needed to help clear and safe up the site and it may take a few days to restore power to the area, preventing gas stations from opening their pumps.
- Inspect and verify that the fire protection systems such as fire pumps and sprinkler systems are in working order.
- If possible, all natural gas lines and main electrical feeds should be shut down to prevent any potential fires or equipment damage.
- During the hurricane (only when applicable and deemed necessary by the ERT), the ERT and/or site security should only stay at the facility if deemed safe to do so. The following actions should be considered:
    - Any critical equipment such as boilers or reactors remaining on-line should be continuously monitored.
    - All electrical switchgear should be deactivated during a power failure to prevent reactivation of equipment before the electrical system is properly inspected for damage.
    - The facility should be toured to watch for damaged windows, doors, piping, roof coverings. Be alert for damaged equipment or wiring that may lead to fires.

After the Hurricane

When allowed by local authorities, secure the site and begin the damage assessment to buildings and equipment. Separate damaged from undamaged materials. Damaged items should be documented and repairs should be prioritized and proceed immediately. Take photos of project after the storm has past to assess damage and help with potential insurance claims.

All electrical systems, natural gas lines, fluid transfer operations, production and maintenance equipment and building structures should be examined by qualified individuals before returning to service. In case of doubt call the local electrical and gas companies. Damaged fire protection systems should be quickly repaired and put back into service as soon as possible.

Before conducting any repairs to the facility, make sure the facility safety programs are fully implemented. Contractors, like employees, should follow proper safety procedures at all times. All potential ignition sources such as smoking and hot work should be controlled by limiting smoking to designated areas

Contact the Doster Construction Safety Department for any assistance.

References

1. Emergency Management Guide for Business and Industry
   (Sponsored by a public-private partnership with Federal Emergency Management Agency http://www.fema.gov/pdf/library/bizindst.pdf
2. State and Local Preparedness Guidance
   (Federal Emergency Preparedness Agency)
   http://www.fema.gov/preparedness/statelocalprepareguide.shtm
3. Hurricane Background and Preparedness
   (Federal Emergency Management Agency)
   http://www.fema.gov/hazards/hurricanes/hurinfo.shtm
4. American Red Cross Hurricane Center
   http://www.redcross.org/news/ds/0305hurricane/
5. Earth Watch Weather On Demand-StormWatch
   www.earthwatch.com/STORMWATCH/stormwatch.html
6. Hurricane Forecasts http://hurricane.atmos.colostate.edu/Forecasts/
7. The Weather Channel Storm Encyclopedia http://www.weather.com
8. IBHS – Institute for Business & Home Safety www.ibhs.org
9. National Oceanic and Atmospheric Administration (NOAA) – National Hurricane Center (NHC) http://nhc.noaa.gov/index.shtml
10. National Weather Service www.nws.noaa.gov
11. NOAA Miami Regional Library www.aoml.noaa.gov/general/lib/hurricbro.html
12. Sandbagging for Flood Protection
    www.ext.nodak.edu/extpubs/ageng/safety/ae626w.htm

DOSTER
CONSTRUCTION COMPANY

Accident / Incident Investigation Report

Accident investigation or incident reports are to be completed by the responsible Superintendent or supervisor as soon after an occurrence as is possible. Upon completion, this report is to be forwarded to the Doster's Corporate Safety Director and Insurance Coordinator at Fax # 205-443-3820.

Report Date: _____

Project Number _____ **Superintendent** _____

Project Manager_____ **Project Safety Mgr.**_____

Check Appropriate Field for Injured Employee:

Doster Employee ☐ **Subcontractor Employee** ☐

Subcontractor Company Name: _____

Employee Name: _____**Date of Employment:** _____

Job Title: _____

Date of Accident or Incident: _____**Time:**_____**am**____**pm**___

Location where Accident / Incident Occurred: _____

Witnesses: _____; _____; _____
(Attach witness statements to this report)

Type of Injury or Damage: _____

First Aid Responder / Medical Provider: _____

Describe what happened: _____
_____

_____

Acts or conditions which may have contributed to this occurrence:

_____

_____

Recommendation(s) to prevent reoccurrence: _____

_____

Corrective Action or interim measures applied pending permanent corrective Safety Procedures: _____

_____

If Environmental related, has a Non-Conformance Form been submitted?___

Supervisor Signature: _____ **Date:** _____

Use the Attachment Form or additional sheets as necessary to record all pertinent data.

DOSTER
CONSTRUCTION COMPANY

Accident / Incident Investigation Report

Accident investigation or incident reports are to be completed by the responsible Superintendent or supervisor as soon after an occurrence as is possible. Upon completion, this report is to be forwarded to the Doster's Corporate Safety Director and Insurance Coordinator at Fax # 205-443-3820.

Attachment Form

DOSTER

TITLE: Non-Conformance Report Form
AUTHOR: Felicia Gregory
APPROVED BY: Walton Doster
REVISION: 1

DOC ID: NCRF
PAGE: 1 of 1
DATE: 10/30/03

Project/**Process**: _____ Date: _____

Auditors: _____ **Dept./Area Representative:**

_____ _____

_____ _____

Reference to Standard: _____

Non-Conformance Explanation: _____

_____

_____

_____

Cause of Non-Conformance _____

_____

Auditor Signature: _____ Date: _____

Representative Signature: _____ Date: _____

Proposed Corrective Action: _____

_____

_____

_____

Agreed Date of Completion: _____ Proposed Follow-up Date: _____

Auditor Signature: _____ Date: _____

Representative Signature: _____ Date: _____

Copy given to Group/Area Manager: _____ Date: _____

Entered in CAR Log: _____

Corrective Action Satisfactorily Completed: _____ Date: _____

Audit Reference Number: _____ NCR Reference Number: _____

Doster Construction Company

Superintendent
Weekly Safety Meeting

Rev 1, 01/2009

Responsibility, Topic, & Sign-In Roster

Date:_____

Job #: _____ Job Name: _____

The Project Superintendent's Responsibility:

On each and every Doster Construction Company project, it is the assigned job Superintendent's responsibility to conduct, or direct, a weekly site-wide Safety Meeting, without fail.

The topic of this meeting will be determined by the Superintendent based on site safety need, or site loss trending. Periodically, the topic of this meeting may also be in the form of a dispatch from the Company Safety Department, based on immediate Company wide safety needs.

This all-personnel 'attendance required' weekly safety meeting will include each Doster Construction Company worker, and all subcontractor, or Managed GC, personnel. There are no exceptions for all site workers to attend this meeting. Failure to attend will result in removal from the project.

This sign-in roster, and topic description sheet, will be maintained in the site safety record files. This data will be made available to Company safety management, upper management, and to any OSHA Field Officer upon request.

Assigned Project Superintendent or Designee / Presentada por:

_____

_____

_____

_____

Topic / Tipo de Instruccion de Seguridad

1) _____

2) _____

3) _____

DOSTER
CONSTRUCTION COMPANY

Doster Construction Company

Superintendent
Weekly Safety Meeting

Rev 1, 01/2009

4) _____

5) _____

6) _____

Attendance Roster / Lista de Asistencia

Doster Attendees / Participantes

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Safety Violations Hotline
1 (205) 281-2274

DOSTER
CONSTRUCTION COMPANY

Doster Construction Company

Superintendent
Weekly Safety Meeting

Rev 1, 01/2009

Attendance Roster / Lista de Asistencia

Subcontractor Attendees / Participantes

Company Name / Nombre de la Compania	Signature / Firma

Safety Violations Hotline
1 (205) 281-2274

Page _____ of _____

DOSTER
CONSTRUCTION COMPANY

JOBSITE SIGN REQUISITION FORM

Please select the signs and quantities needed for your jobsite and fax to the Birmingham office. If you do not see a sign with the needed message for your site, please contact the Operations Administrator with the verbiage and sizes needed. Fax Attn To: Operations Administrator at (205) 443-3820

Job Name: _____ Job #_____ Requested By: _____

SIGN	SIZE	QTY	SIGN	SIZE	QTY
	12” x 24” $16.00			4’ x 8’ $195.00 Required	
	12” x 24” $16.00			3’ x 5’ $108.00 Required	
	11” x 17” $16.00			3’ x 5’ $108.00 Required	
	12” x 24” $16.00			12” x 12” $10.00	
	12” x 24” $16.00			12” x 12” $10.00	
	12” x 24” $16.00			12” x 12” $10.00	
	12” x 24” $16.00			12” x 12” $10.00	
	12” x 24” $16.00			12” x 12” $10.00	

Office Use Only:

Order Date: _____ Date Sent to Jobsite: _____

DOSTER CONSTRUCTION COMPANY

Jobsite Safety Orientation Log

REV. 0 – 9/2007

_____

Jobsite Name & Code

Date	Number	Employee Name	Company

By signing this form employee has viewed the Doster Construction Company Safety Orientation video and completed the jobsite safety orientation requirement.

20.0 Appendix B: Infection Control Onsite Checklist

Project: Date: Time:
Project Coordinator: Location: Contractor:

TABLE 1: Onsite Checklist for

ITEM	Compliance?			COMMENTS
	YES	NO	N/A	
1. CONSTRUCTION BARRIERS				
Barrier integrity maintained, no penetrations.				
Doors close and seal properly.				
Adjacent ceiling areas intact.				
2. NEGATIVE AIR				
Containment area negatively pressurized, relative to adjacent patient care areas.				
Negative Pressure Reading Time:				
Reading:				
All windows and doors closed behind barrier.				
Negative air machine(s) operating properly.				
Negative air machine(s) filters clean.				
Negative air discharge hose(s) intact.				
3. DEBRIS REMOVAL				
Personnel use pre-designated egress routes for debris removal.				
Debris elevator/egress is free of visible dust accumulation. Dry sweeping is not conducted.				
Carts are kept clean, including wheels, prior to egress from the work site.				
Carts transporting debris are covered appropriately.				
High risk patients are not transported in debris elevator.				
HEPA vacuuming of worker clothing and/or workers wearing appropriate clothing barriers				
(e.g. shoe covers and/or clothing covers) in occupied facility				
4. FLOOR MATS				
Mats are vacuumed regularly and free of debris accumulation.				
Sticky mats changed as needed.				
5. CLEANLINESS OF AREA				
Construction area is reasonably clean, with little dust or debris accumulation.				
Adjacent occupied areas, NO dust or debris accumulation.				

DOSTER CONSTRUCTION COMPANY

Emergency Response Team (ERT)

REV. 0 - 9/2007

_____
Jobsite Name & Code

Emergency Response Team Members

1. _____ _____
Contact Name Job Title

_____ _____
Cellular Phone Number Alternative Phone Number

2. _____ _____
Contact Name Job Title

_____ _____
Cellular Phone Number Alternative Phone Number

3. _____ _____
Contact Name Job Title

_____ _____
Cellular Phone Number Alternative Phone Number

4. _____ _____
Contact Name Job Title

_____ _____
Cellular Phone Number Alternative Phone Number

**** If any contact above does not respond please contact Ron Covo, Corporate Safety Director, at:**
(205) 281 2274
(205) 443 3830
(205) 426 2320

Post this form in a visible area within your jobsite

REV. 0 - 9/2007

DOSTER CONSTRUCTION COMPANY

Daily Scaffold Checklist/Inspection

Job Name:_____ Competent Person Signature: _____Date _____

Job Location:_____ Company:_____

The inspection needs to be completed by the designated competent person on a daily basis.

	YES	NO	N/A	ACTION/COMMENT
1. Are sills properly placed and adequate size?				
2. Have screw jacks been used to level and plumb scaffold instead of unstable objects such as concrete blocks, loose bricks, etc.?				
3. Is scaffold level and plumb?				
4. Are all scaffold legs braced with braces properly attached?				
5. Is guard railing in place on all open sides and ends above 6'?				
6. Do all components (cross bracing, frames, etc.) fit properly?				
7. Has proper access to working levels been provided?				
8. Has overhead protection, toe boards, or wire screening been provided?				
9. Are toe boards installed properly?				
10. Has scaffold been tied to structure at least every 30' in length and 20' in height?				
11. Are working levels platforms fully planked between guard rails?				
12. Do planks have minimum 12" overlap and extend 6" beyond support?				
13. Have all planks been inspected?				
14. Have any planks been found that are warped, damaged, or otherwise unsafe? Have they been removed and replaced by planks that do meet loading requirements?				
15. Have hazardous conditions been provided for: Power lines? Wind Loading? Possible washout of footings? Uplift an overturning moments due to placement of brackets, putlogs or other causes?				
16. Is scaffold free of makeshift devices or ladders to increase height?				
17. Have personnel been instructed in the safe use of the scaffold?				

This form has to be turned in with Subcontractor Daily Report to Doster Construction Company Inc.'s Jobsite Superintendent

Date:_____ Signature:_____

Competent Person

Crane Daily Pre-Operation Inspection Form

DOSTER
CONSTRUCTION COMPANY

Daily Pre-Operation Inspection

JOBSITE NAME:_____ JOBSITE CODE:_____

DATE: ____-____-____ TIME: _____ A.M. / P.M.

EQUIPMENT ID #: _____ ODOMETER/HOUR READINGS: _____

CARRIER / SUPERSTRUCTURE ITEMS: _____ NEXT SERVICE DUE: _____

Interior

(CHECK ANY DEFECTIVE ITEM AND GIVE DETAILS UNDER REMARKS)

Pass	Fail		Pass	Fail		Pass	Fail	
☐	☐	Parking Brake	☐	☐	Mirrors	☐	☐	All Gauges (Air, Oil, Etc...)
☐	☐	Swing Brake	☐	☐	Steering Wheel (Slack)	☐	☐	Anti-Two Block Device
☐	☐	Travel Brake	☐	☐	All Light Switches	☐	☐	Load Moment Indicator
☐	☐	Oil Pressure	☐	☐	All Glass	☐	☐	All Limit Switches
☐	☐	Air Pressure	☐	☐	Fire Extinguisher	☐	☐	Load Charts
☐	☐	Low Air Warning Device	☐	☐	Fuses	☐	☐	Cleanliness
☐	☐	Warning Devices/Buzzers	☐	☐	All Control Mechanisms	☐	☐	Telescope
☐	☐	Horn	☐	☐	Swing	☐	☐	Auxiliary Hoist
☐	☐	Windshield Wiper	☐	☐	Automatic Boom Kick-Out	☐	☐	Main Hoist
☐	☐	Heater/Defroster	☐	☐	Boom Angle Indicator	☐	☐	Outrigger Control
☐	☐	Locking Devices	☐	☐	Boom Hoist	☐	☐	Other

Exterior

(CHECK ANY DEFECTIVE ITEM AND GIVE DETAILS UNDER REMARKS)

Pass	Fail		Pass	Fail		Pass	Fail	
☐	☐	Headlights/Taillights	☐	☐	Torque Converter	☐	☐	Wedge Sockets
☐	☐	Clearance Lights	☐	☐	Transfer	☐	☐	Sheaves/Guards
☐	☐	Turn Signal/Hazard Lights	☐	☐	Drive Shaft/U-Joints	☐	☐	Block/Hook/Swivels
☐	☐	Lugs/Tires/Wheels	☐	☐	Differential	☐	☐	Boom
☐	☐	Fuel Tank/Cap	☐	☐	Front/Inter./ Rear Axles	☐	☐	Jib/Pins/Sheaves
☐	☐	Outrigger Controls/Locks	☐	☐	Master Cylinder	☐	☐	Counterweight Controls
☐	☐	Radiator	☐	☐	Hydraulic System	☐	☐	Rigging/Belts/Slings/Etc...
☐	☐	Drive Belts	☐	☐	Steering Gearbox/Controls	☐	☐	Swing Radius Barricaded
☐	☐	Air Tank/Lines	☐	☐	Springs/Shocks/Shackles	☐	☐	Visual Inspection of
☐	☐	Exhaust Lines/Muffler	☐	☐	All Lubricant/Fluid Levels	☐		Working Radius
☐	☐	Transmission	☐	☐	Hoist Drum Cables	☐	☐	Other

Remarks:

_____

_____

_____

☐ CONDITION OF THE ABOVE VEHICLE IS SATISFACTORY
☐ ABOVE DEFECTS CORRECTED
☐ ABOVE DEFECTS NEED NOT BE CORRECTED FOR SAFE OPERATION

Driver's Signature: _____

Mechanic's Signature: _____

Supervisor's Signature: _____

Used by Doster Construction Company under authorization from Craneworks, Birmingham, Alabama
© 2005 CraneWorks Inc.

DOSTER CONSTRUCTION COMPANY	**Daily Aerial Lift Inspection**	REV. 0 – 9/2007 Lift Type:_____ Lift Model No.:_____

Contractor Name :_____ **Inspectors Name:_____**

Operator's Card Verified: ☐ **Y** ☐ **N** ✓ **For Pass** **X For Fail**

Date	/	/	/	/	/	/	/
1. Operating and emergency controls are in proper working condition……							
2. Upper drive controls interlock mechanism is functional (dead man switch)……..							
3. Emergency lowering mechanism operates properly…….							
4. Lower operating controls override upper controls……..							
5. Upper and lower controls are adequately protected from inadvertent operation……							
6. Control panel is clean and all buttons and switches are clearly visible……...							
7. All switch and mechanical guards are installed and in good condition……...							
8. All safety indicator lights are operating properly…….							
9. Drive controls are properly labeled and functioning……							
10. Motion alarms are functional and clearly audible……...							
11. All safety decals are in place and clearly readable…….							
12. All guardrails are sound and in place, including safety chains…….							
13. Work platform and extension slides are clean from debri and trash……..							
14. Work platform extension slides freely and locking mechanism is in place and functional...							
15. Any defects (cracked welds, fuel or hydraulic leaks, damaged cables/wires) present							
16. Tires and wheels in good functional condition (air pressure)……							
17. Are all breaking devices operating properly…….							
18. Manufacturer's operators manual present on the lift and in good condition…….							
19. Hazardous energy in vicinity (electrical lines overhead, utilities, drain lines, etc)……							
20. Surface conditions (drop offs, holes, uneven surfaces, etc.)……							

Comments :

_____

_____

_____

Doster Representative Initials:_____

Form to be completed daily and kept with the equipment at all times. At the end of the week turn in to project Superintendent.

DOSTER

Crane Critical Lift Plan

Project:		**Critical Lift Date:**		
1. Critical Lift Plan Due to (Check all that apply): ◯ Load capacity is equal or exceeds 75% of load chart rating. ◯ Two or more cranes will be used during the lift. ◯ Any unusual circumstances. Specify:				
2. Crane Description:				
3. Load Description:				
4. Load Weight: _____	Weight determined: _____			
5. Rigging Weight: _____	Type:	_____		
6. Total Weight:	Load			
	+ Rigging			
	+ Attachments			
	- Load Chart Deductions			
	Total Weight:			
7. Equipment:	Maximum Operating Radius:			
	Planned Operating Radius:			
	Allowable Load From Crane Load Chart:			
8. Clearances:	Clearance b/w boom and lift:			
	Clearance with surrounding objects:			
9. Ground / Stability:	Ground compact and stable:	Y		N
	Outrigger Size:			
10. Weather:	Favorable:	Y		N
	Predicted wind speed at lift time:			
		If wind exceeds 25 mph lift cannot proceed. *If wind exceeds 20 mph consider postponing lift.*		
11. Communication between signal man and Operator:				
	Hand Signals Two Way Radio Telephone Other	◯ ◯ ◯ ◯ Specify:		

DOSTER

Crane Critical Lift Plan

Page 2 -
12. Other Considerations:

- Procedures to safeguard pedestrian or other construction workers in vicinity:
  _____
  _____
  _____

- Additional Comments:
  _____
  _____
  _____

Acknowledgements:

Title	Signature	Date
Crane Operator	_____	_____
Crane Inspector (If Applicable)	_____	_____
Rigger		
Lift Supervisor	_____	_____
Signal Man	_____	_____
Site Superintendent		

NOTE: Only after ALL representatives have signed the Crane Critical Lift Plan the lift can proceed.

DOSTER CONSTRUCTION COMPANY	**Daily Equipment Inspection**	REV. 0 – 9/2007 Project Name:_____ Equipment:_____

Contractor Name: _____ Inspectors Name:_____

DATE

Inspection Item	/	/	/	/	/	/	/
Operators Manual							
Tracks, tires, wheels							
Brakes & Clutch							
Horn / Back Up Alarm							
Signal System & Warning Lights							
Lights							
Seat Belts							
Windshield Wiper							
Rear View Mirror							
Fire Extinguisher							
Fuel Tank							
Fuel & Gas Lines							
Grab Bars, Steps							
Gauges & Switches, Dump Mechanism							
Steering							
Body & Frame							
Motor (Wiring)							
Radiator							
Exhaust System							
Belts & Hoses							
Boom & Boom Hoist							
Sheaves Hooks							
Decals & Identification							

Comments:_____

_____

_____

Doster Representative Initials:_____

Form to be completed daily and kept with the equipment at all times. At the end of the week turn in to project Superintendent.

Superintendent
Weekly Jobsite Safety/Environmental Check List

Date: Job Name:

Job #: Inspected By:

Current Status of contract (check one):

- ☐ Site Clearing & Grubbing
- ☐ Structural Frame
- ☐ Demolition
- ☐ Close Out
- ☐ Foundations
- ☐ Interior Finishes
- ☐ Remodeling
- ☐ Excavation
- ☐ Overhead Mechanical / Electrical
- ☐ Other:

(C) Indicates Compliance (X) Indicates Non-Compliance (N) Indicates Not Applicable

1. Adminstrative (Subpart C)

- ☐ OSHA 300 posted/updated
- ☐ Weekly toolbox safety meeting
- ☐ Emergency Phone #s posted
- ☐ Required signs (hard hats, etc.)
- ☐ Hazcom Program w/ Inventory listed and MSDS
- ☐ First Aid / CPR equipment supplied/available
- ☐ Copy of OSHA standards available

2. Housekeeping (Subpart C & D)

- ☐ Exits / Stairs clear
- ☐ Regular Cleaning
- ☐ Trash Containers Available
- ☐ Nails bent or removed
- ☐ Toilet facilities adequate/functioning

3. Personal Protective Equip. (Subpart E)

- ☐ Hard Hats
- ☐ Gloves
- ☐ Shirts w/ Sleeves
- ☐ Long Pants
- ☐ Hard Sole Shoes
- ☐ Safety Glasses / Goggles

4. Fire Protection (Subpart F)

- ☐ Extinguisher at Fuel Tanks
- ☐ Fuel/Flammable storage at least 25ft. from buildings
- ☐ Fire Extinguishers not less than 100ft. travel distance.
- ☐ Safety Gas Cans
- ☐ Cylinders (secured, vertical, caps, 20ft separation).
- ☐ Exit Access unobstructed.

5. Public Protection (Subpart G)

- ☐ Fences (Silt/Orange)
- ☐ Barricades / Gates
- ☐ Flagging
- ☐ Traffic Control / Signs
- ☐ Handrails
- ☐ Applicable Signage

6. Tools / Equipment (Subpart I)

- ☐ Proper Condition
- ☐ Powder Actuated Certified
- ☐ Guard Usage
- ☐ Grounded
- ☐ Inspected / Ground Assurance Program

7. Electrical (Subpart K)

- ☐ Lighting Adequate / Controlled
- ☐ Protected covers on Lighting
- ☐ Three prong construction Cords / 12 Guage
- ☐ GFCI present
- ☐ Panel Covers secured / locked
- ☐ Adequate temporary power

8. Scaffolds (Subpart L)

- ☐ Sounds footing.
- ☐ Safe access / ladder
- ☐ Guard Rail System
  - ☐ 42” and mid rail
  - ☐ Toe Boards (4”)
- ☐ Solid planks/ Platforms
- ☐ Tied to Building
- ☐ Planks over support (min. 6”, max. 12”)

9. Fall Protection (Subpart M)

- [ ] Harnesses / Lanyards used
- [ ] Perimeter secured
- [ ] Guardrail Systems in place.
  - [ ] Top Rail
  - [ ] Mid Rail
- [ ] Floor / Roof / Wall Opening / Secured / Marked
- [ ] Elevator Shaft Secured
- [ ] Skylights Covered / Protected
- [ ] Mechanical Openings Protected
- [ ] Safety Caps on Rebar
- [ ] Aerial Lifts
  - [ ] Harness
  - [ ] Lanyards
  - [ ] Toe Boards

10. Cranes (Subpart N)

- [ ] Annual Inspection Report Available
- [ ] Operator Certification Available
- [ ] Swing Radius Protected
- [ ] Fire Extinguishers on Crane
- [ ] Limits Conspicously Posted
- [ ] Overhead Electrical Surveyed
- [ ] Inspection Reports Available

11. Motor Vehicle / Equipment (Subpart O)

- [ ] Brakes & Seat Belts
- [ ] Horns & Backup Alarms
- [ ] Rollover Protection
- [ ] Fire Extinguisher on Equipment
- [ ] Leaks

12. Excavation / Trenches (Subpart P)

- [ ] Means of egress / access / ladders / shoring / sloping / trench box
- [ ] Protective system in place
- [ ] "One Call" utility service
- [ ] Competent routine inspection
- [ ] Spoils at least 2 ft. from edge
- [ ] Mechanical / Electrical / Plumbing piping in excavation supported

13. Stairs / Stairways (Subpart X)

- [ ] Handrails over 4 risers or 30"
- [ ] Proper rise / run
- [ ] Pan stairs filled or blocked
- [ ] Access / egrees clear

14. Ladders (Subpart X)

- [ ] Good Condition
- [ ] Used Properly
- [ ] Secure bottom from displacement
- [ ] Extend 3' above landing
- [ ] Tied to structure
- [ ] Non Slip / uniform rungs
- [ ] Clear of debris

15. Special

- [ ] Blasting Reports Daily
- [ ] Blasting Warning Signal
- [ ] Masonry Access Zone
- [ ] Temporary Heating
- [ ] Renovations – Trip Hazards, General Public
- [ ] Sanitary / Portable Sanitary Stations
- [ ] Hand Wash Stations Available

16. Environmental Management System

- [ ] Erosion Control in Place / SWPPP
- [ ] Concrete Washout used & maintained
- [ ] Water sources controlled
- [ ] Recycling material per environmental plan (as applicable)
- [ ] Leaks (Hyrdo / Combustible)

Comments & Job Specific Items: _____

_____

_____

_____

** Items which are non-compliant should be corrected immediately. Send copy of non-compliance to the Subcontractor. Copy Bruce VanArsdale.